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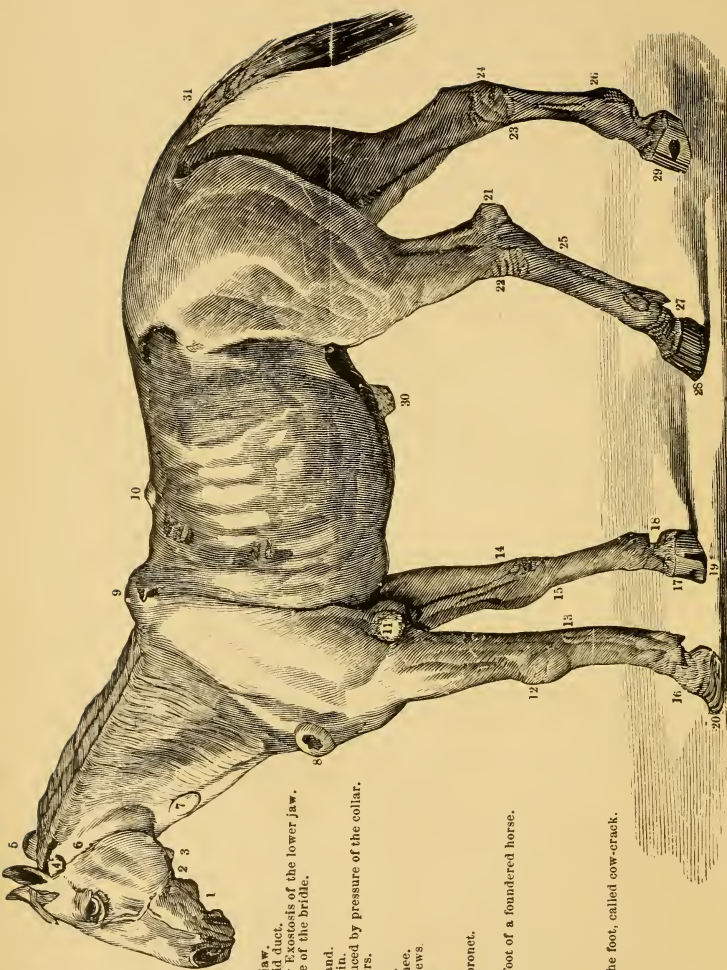
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1. Caries of the lower jaw.
2. Fistula of the parotid duct.
3. Bony excrescence or Exostosis of the lower jaw.
4. Swelling by pressure of the bridle.
5. Poll-evil.
6. Inflamed parotid gland.
7. Inflamed jugular vein.
8. Fungus tumor, produced by pressure of the collar.
9. Fistula in the withers.
10. Saddle-gall.
11. Tumor of the elbow.
12. Induration of the knee.
13. Clap of the back sinews.
14. Malanders.
15. Splint.
16. Ring-bone.
17. A tread upon the coronet.
18. Quittor.
19. Sanderack.
20. Contracted or Ring foot of a foundered horse.
21. Capped hock.
22. Malanders.
23. Spavin.
24. Curb.
25. Swelled sinews.
26. Thick leg.
27. Grease.
28. A crack in front of the foot, called cow-crack.
29. Quarter-crack.
30. Ventral hernia.
31. Rat-tail.

DISEASES OF THE HORSE

AND

How To Treat Them

A Concise Manual of Special Pathology

FOR THE USE OF

Horsemen, Farmers, Stock-Raisers, and Students
in Agricultural Colleges in the
United States.

BY

Robert Chawner and J. H. Walsh, F.R.C.S.

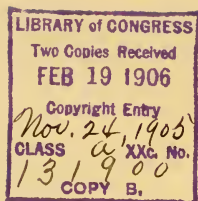
With an Introduction by Henry T. Coates

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INTRODUCTION.

When, in 1856, "~~The~~ Manual of British Sports by 'Stonehenge'" was published, the reading community recognized the appearance of a master mind,—*the* authority on the many subjects of rural life, handled with consummate ability in its closely-printed, double-column pages. Whatever subject "Stonehenge" touched upon he adorned. His charming style, thorough knowledge of his subject, evident enjoyment of his work and his entire sympathy with that outdoor life which has made England the beau ideal home of the country gentleman the world over. So great was the success of the work that sixteen editions, thoroughly revised and brought up to date, were issued in the next thirty years, when the thirty volumes of the Badminton Library took its place, a monument to the interest Stonehenge's work had created.

In no portion of the work was the author's genial erudition more apparent than in the portions dealing with the breeding and care of horses, and when, five years later, his "Horse in the Stable and the Field; His Management in Health and Disease" appeared, its success was instant and complete. In his modest Preface the author says: "We believe it may be asserted without fear of contradiction that no book has yet been published in the English or any other language which even professes to give a complete description of the Natural History, Physiology, Pathology, and General Management of the Horse in a form and style suited to the country gentleman of the nineteenth century. It is true that some of these departments are adequately described in separate works; but they are generally written in technical language, suited rather

to the veterinary student than for the use and comprehension of the ordinary reader. . . . For these reasons the author of this work has thought that a book, combining all the above subjects, treated in a practical manner, and a style popularly intelligible, yet containing the most recent views of eminent authorities in veterinary knowledge, would supply a deficiency which has long been complained of by all who are interested in the proper management of the horse."

The success of this work was as great as its predecessor, and though many years have elapsed since then and many works on the same subject have appeared on both sides of the ocean, it has never been superseded. The reason of its success and endurance is that the author was peculiarly fitted for his work. In the Dictionary of National Biography, Vol. LIX, his biography is thus given :

Walsh, John Henry (1810-1888), writer on sport under the pseudonym of Stonehenge, son of Benjamin Walsh, was born at Hackney, London, on October 21, 1810, and educated at a private school. In 1832 he passed as a member of the Royal College of Surgeons, and became a fellow of the college by examination in 1844. For some time he was surgeon to the Ophthalmic Institution, and lectured on surgery and descriptive anatomy at the Aldersgate School of Medicine. For several years he was in practice at Worcester, but left that city for London in 1852. He always had an intense love of sport, he rode well to hounds, kept greyhounds, and entered them at coursing meetings, broke his own pointers and setters, and, what is less common, also trained hawks. In the management of dogs he became an especial adept, and few veterinary practitioners could compare with him in the treatment of dogs' diseases. He was also fond of shooting, and, owing to the bursting of his gun, lost a portion of his left hand. In 1853, under the pseudonym of "Stonehenge," he brought out his work on "The Greyhound, on the Art of Breeding, Rearing, and Training Greyhounds for Public

Running, their Diseases and Treatment" (3d ed. 1875). This treatise was based on articles he had written in "Sell's Life," and it remains the standard text-book on the subject. Three years later, in 1856, appeared "Manual of British Rural Sports," which treats of the whole cycle of sports, and, among other things, deals with the breeding of horses in a scientific manner. Sixteen editions of this work were published up to 1886, in the later editions articles on special subjects being furnished by other writers. In 1856 he originated the "Coursing Calendar," and conducted it through fifty half-yearly volumes. About 1856 he became connected with the "Field," and at the end of 1857 accepted the editorship. He brought out "The Shot Gun and Sporting Rifle, and the Dogs, Ponies, Ferrets, etc., used with them in Shooting and Trapping," in 1859; "The Dog in Health and Disease," 1859 (4th ed. 1887); "The Horse in the Stable and in the Field," in 1861 (13th ed. 1890); and "The Dogs of the British Islands," in 1867 (3d ed. 1886). In the two books last mentioned he had also the assistance of other writers. In 1882-4 the "Modern Sportsman's Gun and Rifle" appeared, Vol. I being devoted to shot guns, while Vol. II treated of rifles. His activity in conducting the "Field," with the aid of many able coadjutors, was remarkable. He soon instituted the first "Field" trial of guns and rifles, which was carried out in April, 1858, in the Ashburnham grounds at Chelsea, adjacent to the famous Cremoine Gardens. This trial wound up the controversy as to the merits of breech-loaders and muzzle-loaders, but before the final decisions two other trials were made, one at the old Hornsey Wood Tavern in July, 1859, and the third at the Lillie Arms, Broughton, in 1866.

"He was a good chess player, and on the managing committees of several clubs. He died at 43 Montserrat Road, Putney, Surrey, on February 12, 1888, and was buried in the old cemetery at Putney Common. He married, first, in August, 1833, Margaret, daughter of Thomas Stevenson, of Claines,

Worcestershire, who died nine months later ; secondly, in 1835, Susan Emily, daughter of Dr. Malden, of Worcester, who died eight months later, and, thirdly, in 1852, Susan, eldest daughter of the Rev. William Parker, who survived her husband. He left two daughters."

In conclusion, the writer desires to pay a personal tribute to the memory of one whom he has never seen or known, save in his writings, for an unexpected and kindly act of courtesy at a time and under circumstances which made it especially grateful to the recipient, and which none but a noble-minded gentleman would have done.

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THE DISEASES OF THE HORSE,

AND

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CHAPTER I.

THE DISEASES AND INJURIES OF BONE.

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GENERAL REMARKS.

THE DISEASES OF BONE are not commonly attended by any constitutional disturbance, and neither require an examination of general symptoms, nor the adoption of any but local treatment, beyond that attention to the health which is always necessary. They may all be included under the heads of,—1st. Exostosis, or increased growth of bone. 2d. Caries, or ulceration. 3d Anchylosis, or unnatural union of two bones, in consequence of exostosis, or caries, or both. 4th. Fractures, or disunion by external force. Malignant diseases of the bone also occur very rarely in the horse, so that it will be scarcely necessary to occupy any space with their description, especially as they are perfectly incurable.

EXOSTOSIS is the result of increased action in the nutrition of the part, and is much more prevalent in young horses than in old. Indeed, after six or seven years of age it is very rarely met with, and never attacks the bones at that age for the first time. It may be recognised by a hard swelling of the part, which in recent cases is painful on pressure; but sometimes its site cannot be reached with the finger, and the disease can then only be detected by its effects. A blow upon any of the bones, when unprotected by any thing but skin, will produce inflammation followed by exostosis;

but the most ordinary cause is the over-stimulus of hard work. Heavy horses are more prone to exostosis than light ones, partly from the weight of their bodies and their high lumbering action jarring their limbs in a greater degree, but also from the more spongy and open texture of their bones, which admit of the pressure of large blood-vessels within them, and are thus more liable to congestion, and consequent morbid secretion. Exostosis is shown in the form of splints, ring and sidebone, and ossified lateral cartilages, as well as in the growths which occur occasionally in other parts of the body which have received no distinguishing name. The vitality of the new growth in exostosis is less than that of healthy bone, and as a consequence, when excessive inflammation is set up in the part, it will often die and be separated by absorption.

CARIES (ulceration) occurs as a consequence of inflammation, and in the horse either results from external injury, as in poll evil and fistulous withers, or from mismanagement, as in navicular disease, which latter affection will be considered under the diseases of the foot. It is always attended with pain, and in severe cases with the formation of sufficient matter to require an outlet, but in very restricted ulcerations, such as occur in navicular disease, the pus passes into the joint, and is reabsorbed with the synovia.

ANCHYLOSIS, when it is the result of caries in the two adjacent surfaces of a joint, produces union between them, but in the horse it is generally of a secondary kind, the result of bony growths (exostosis), thrown out from the surfaces of the two bones near the joint, which coalescing, unite into one mass, and thus destroy all motion.

SPLINTS.

THE STRICT DEFINITION of this disease is "an exostosis from the lower part of the small metacarpal bone, connecting it by bony union with the large metacarpal bone," but among horsemen, any bony growth from the cannon bone is considered a splint, and the latter is almost as common as the former. The regular splint rarely attacks the outer small metacarpal bone alone, but sometimes in very bad cases both are implicated in the disease. It is difficult to give a valid reason for this greater frequency of splint on the inside than on the out, but it is commonly said that the inner splint bone receives more of the weight of the body than the outer one, and that it is more under the centre of gravity, but as it is merely suspended from the carpus, and is not supported from below (in any way, mediately or directly), this can produce no injurious effect upon it. The fact is so, however, whatever may be the cause.

The symptoms of splint are generally a greater or less degree of lameness during its formation, but sometimes it may go on to attain a large size without any such result, especially if its growth is slow.

and the horse is not severely worked. It is commonly remarked that a splint is of no consequence unless its situation is such as to interfere with the back sinews, or suspensory ligament, and although it is quite true, as has been asserted by learned veterinarians, that the splint is far removed from the former, and seldom interferes with the latter, yet it is almost always directly connected with the attachments of the sheath of the tendon, and this being stretched every time the leg is extended will occasion the pain which is expressed by the limp in the action. The size of the morbid growth has no relation with the amount, or even with the existence of lameness, for a very small splint will often be far more productive of this symptom than a very large one. In examining a leg it is often only after careful manipulation in the flexed condition that a small bony tumor (of the size perhaps only of a garden pea) can be detected, but when once the finger presses upon it, the horse will almost invariably be found to flinch, and usually it will be thrown out just where the sheath of the tendon is attached. Here there is no union between the small and large metacarpal bones, and the injury is confined to the inflammation produced in the sheath, which will generally go off after proper treatment and rest. These small bony growths are not very uncommonly met with in the hind legs, but they are not recognised there as splints. No constitutional symptoms are met with in these cases, and they must be ascertained by the local symptoms alone. Unless the splint is in the way of the action of the other foot, and the skin on its surface is bruised by repeated blows, there is seldom any swelling of the soft parts, but when this occurs, the skin and cellular membrane become puffed and hot, and extreme lameness is the result, temporarily aggravated by every blow.

The treatment of a splint will depend upon the state in which it exists, and upon the purpose to which the horse possessing it is destined. If no lameness exists, and the blemish is not objected to, it is far better not to meddle with it, for in the course of a few years it will disappear by absorption as a matter of course. Moreover it often happens that in attempting to remove a splint by some irritating application, extensive inflammation is set up in the fibrous strictures attached to it, and lameness, which was not previously in existence, is thenceforth a most troublesome attendant. If, however, the horse is for sale, in which case the existence of a splint would be regarded with suspicion, or if lameness has shown itself, it will be necessary to adopt measures likely to effect the absorption of the morbid growth, and these are chiefly two:—1st, Sub-cutaneous scarification, or without, a seton, or the seton alone; and 2d. Counter-irritation by means of some form of blister. If the soft parts covering the splint are much inflamed, the horse should have his corn taken away, and a dose of physic

given him, during which a wet bandage should be kept constantly applied, and indeed, in any case of splint severe enough to require operation, the cooling remedies mentioned above should be adopted beforehand. The operation is performed with a probe-pointed narrow knife, shaped like a scimitar, with the cutting edge on the convex side. A small opening is made in the skin about an inch below the splint, and just large enough to admit the knife, which is then introduced and pushed upwards with its flat side towards the skin, till it reaches the tumor, when the convex edge is turned towards this, and several extensive scarifications are made in the periosteum covering it, after which the knife is withdrawn and a fine seton-needle is introduced in its place, and passed upwards until it reaches above the splint, when it is pushed through, and the tape drawn out, and properly secured with a bandage. Of course the horse must be cast and properly secured before resorting to the knife. In the course of ten days or a fortnight, the tape may be withdrawn, and the splint will almost invariably disappear. Sometimes the seton is tried without the scarification, but it is not nearly so successful, and is nearly as troublesome an operation. In most cases both of these operations are unnecessary, and the application of the following blister (which has a tendency to produce absorption, independently of its counter irritative powers) will have the desired effect.

Take of Biniodide of Mercury 1 drachm
Lard 1 ounce. Mix,

and after cutting the hair short, rub a little into the skin covering the splint, every night, until a free watery discharge is produced from the surface. To facilitate this the leg should be fomented with *very* hot water every morning and afternoon, and this should be continued for several days after the ointment has been discontinued. The horse will not gnaw the skin after this application, and it is a very useful one for general purposes, when counter-irritation is required to produce absorption. If, after a week's interval, the splint does not appear much reduced in size the ointment should be re-applied, and repeated at similar intervals till the swelling is removed. When the bony growth is very extensive, neither scarification nor counter-irritation will be of much service, and the leg must be fired, and afterwards repeatedly blistered, but even with the best and most energetic treatment, the part will seldom become sufficiently sound to stand anything but slow work.

RINGBONE AND SIDEBONE.

RINGBONE AND SIDEBONE both consist in the throwing out of bony matter about the joints of the os coronæ; the former name being given to the disease when it attacks that between it and

the os suffraginis, and the latter when the seat is the parts around its union with the os pedis or coffin bone. Very often and especially in heavy cart or dray horses, ringbone and sidebone co-exist in the same leg, where the three bones are completely ankylosed, and in which, during life, the only action was in the fetlock joint. The disease attacks the hind leg as well as the fore; but it is more common in the latter than in the former.

The *symptoms* are a greater or less enlargement of the leg, of a hard and unyielding nature, either immediately above the coronet, as in sidebone, or a little higher, as in ringbone. In the latter case, if thoroughly established, it surrounds the joint, whence the name of ringbone; but in the early stages it appears at certain points from which it spreads all round. Sidebone is seldom so extensive, and usually attacks the postero-lateral parts of the os coronæ, where the swelling is defined, and, except in very hairy-legged or gummy-heeled horses, can easily be felt. In the early stages the action is not impeded, but there is more or less soreness or lameness. After much bone is thrown out, the joints are either completely fixed or their movements are extremely limited.

The *treatment* in the early stage is precisely similar to that for splint; but the operation of scarifying the periosteum requires great care and some knowledge of the anatomy of these joints, or the knife will pierce the capsular ligament, and increase the evil it was intended to relieve. A seton without the scarification will often be of service, and for sidebone, firing in the early stage will be serviceable, though it is objectionable on account of the blemish it leaves behind. The biniodide of mercury ointment already described is most useful in slight cases, but in severe ones it will rather tend to aggravate the growth, and when ankylosis has taken place, nothing but time and patience for the subsidence of the inflammation will avail. When this has taken place, and the joint is fixed, a high-heeled shoe will enable the horse to work, with some awkwardness it is true, and the addition of a leather sole, will to some extent take off the jar, which occurs in a greatly increased ratio when the elastic action of the pastern joints is destroyed.

OSSIFICATION OF THE LATERAL CARTILAGES.

THIS IS COMMONLY KNOWN as ossification of the cartilages, or false ringbone, no other cartilages being subject to ossification, and these being therefore known *par excellence* as the cartilages. In heavy cart-horses it often co-exists with ringbone and sidebone, especially the latter; but it also attacks well-bred carriage-horses, and high-actioned hacks, which are comparatively free from those diseases.

The *symptoms* are more or less enlargement of the back of the

coronet, and heel, the part feeling unnaturally hard and irregular or lumpy. If recent, there is generally increased heat or careful examination with the hand; but in old standing cases there is nothing of the kind to be detected. Lameness is not always present, but if the horse is rattled over hard ground, he will be more likely to show the effects on the next day, by going short and sore, than if he were free from this disease.

The *treatment* should be confined to recent cases, for in old standing ones, unless lameness shows itself, it is better to avoid any interference. A seton, with rest, has sometimes proved very efficacious, even in confirmed ossification, and repeated dressings with the Linjodide of mercury ointment, will, in those cases where the inflammation does not run very high, afford the best chance of causing the absorption of some of the bone, for a complete cure is never effected. When there is much heat in the part, bleeding from the foot may be adopted, and afterwards, the application of cloths dipped in cold water, with the addition of a glass of tincture of arnica to quart of water. In confirmed cases, where the parts have become callous, a leather sole to the shoe will take off the vibration, and should be used during the summer season. Scarification of the skin covering the enlargement with a lancet, encouraging the bleeding by warm water, and followed by the use of cold water as soon as the bleeding has ceased, will sometimes do wonders in recent cases. The scarification should be repeated at intervals of five or six days, taking care to avoid injury to the coronary substance near the hoofs, which is sometimes followed by troublesome sores.

BONE SPAVIN

THIS DISEASE, so frequently the cause of lameness in those horses which use their hocks severely (as for example race-horses, hunters, carriage-horses, and more particularly cart-horses), consists in exostosis from the adjacent external surfaces of the tarsal bones, always showing itself at the inner side of the hock joint, on the scaphoid and cuneiform bones, and extending to the head of the internal small metatarsal bone. As in the case of splint, the occurrence of exostosis on the internal rather than on the external side of the hock has been accounted for by the supposition that increased weight is thrown upon the internal small metatarsal bone, from the turning up of the outer heel of the shoe, which is the common practice of smiths. It appears to me, however, that the contrary is the case, and that though more stress is laid upon the foot on that side, there is less weight on the inner side of the hock, which has a tendency to spring open in that direction. This will cause a strain upon the ligaments connecting the tarsal bones, and nature coming to their aid throws out bone, which ultimately sub-

stitutes anchylosis for ligamentous union between these bones. In all the actions of the hind leg, from the natural shape of the hock, and more especially in those horses which are naturally "cow-hocked," there is a tendency to yield inwards rather than in the opposite direction. The consequence is that there is more strain upon the ligamentous fibres which connect the scaphoid with the two cuneiform and the internal metatarsal, than upon those uniting the cuboid with the os calcis and external metatarsal bone. Hence, although exostosis does sometimes show itself in other parts of the tarsal bones, it here, as in the fore leg, is almost always confined to what is called the "spavin place," namely, the contiguous surfaces of the scaphoid, cuneiform, and internal metatarsal bones. In very bad cases the articular cartilage becomes involved, and there is not only an external casing of new bone, but the internal surfaces absolutely coalesce or anchylose.

THE SYMPTOMS of spavin are a *hard* substance showing itself beyond the proper level of the hock joint. There may or may not be lameness, but if bone is thrown out the disease is established. In recent cases whenever the horse is worked he will *after rest* limp in his action, but the lameness soon goes off, and does not show itself again until the part has been suffered to become stiff by a rest of an hour or two. The lameness is very remarkable, and differs greatly from that shown in any other disease. The leg is drawn up with a quick catch, and yet there is a dragging of the limb, indicating not only pain in the joint, but a want of action in it. In the early stages the latter is not clearly developed, but afterwards it is so well marked that a spavin may be pronounced to exist without an examination of the joint. Where lameness is not established, great care should be exercised in pronouncing on the existence of spavin, for some hocks are naturally formed with prominent heads of the internal metatarsal bones, and the inexperienced eye and hand are very apt to mistake these for exostosis. In such cases, by comparing the two hocks it will generally be seen that they are both exactly alike, while in spavin, although both joints may be the seat of mischief, yet they will seldom manifest the disease to the same extent.

The *treatment* should be directed to the abatement of the inflammation which gives rise to the pain, and also to promote absorption of the new growth. Veterinary surgeons are very apt to assert that the disease cannot be cured, and that a spavined horse will always remain the subject of it, and therefore unsound. But practically it is known that many a hock which has been the seat of undoubted spavin loses all external enlargement, and no lameness is shown in it, although tried most severely through a series of years. Still on dissection after death, the ligaments will not show their natural white and glistening structure, and the tarsal bones

will be to a certain extent united by ankylosis. In very bad cases there will be also caries of the articulatory surfaces, and with it inflammation of the synovial membranes, which may and often does exist without the caries. Now as these are much more formidable diseases than exostosis, and far more difficult either to cure or palliate, it follows that although certain remedies will be generally successful with genuine bone spavin (exostosis), yet they will fail when the above complication exists. The treatment must therefore be adapted to the exact nature and extent of the disease. Prior to the adoption of any plan the joint should be rested, the outer heel of the shoe should be lowered, the corn should be taken away, and the system cooled by appropriate treatment. After these precautions are taken, the next thing is to decide upon the remedies which will be suited to the case. They consist in—1. Blisters, which have a tendency to cause absorption; 2. Firing; 3. Setons, with or without subcutaneous scarification; 4. Division of the nerve. If there is simply a slight exostosis, with little lameness, and no evidence of the joint being implicated, the biniodide of mercury may be applied as described at page 300. Repeated dressings will be necessary, and the joint must have at least two months' absolute rest, the horse being placed in a loose box. This remedy is often successful, but it will fail utterly where the exostosis is extensive, or there is caries, or even severe inflammation of the synovial membrane. Arsenic, sulphuric acid, and other caustic applications, have been counted as infallible cures; but while they are just as certain to produce a blemish as firing, the extent to which the inflammation and sloughing, caused by them, go is far more completely beyond our control. Arsenic has been known to destroy the joint, by producing a slough of the synovial membrane, and it is said that the sulphuric acid, which, however, is often very successful, has had a similar unfortunate result; but of its being followed by serious blemishes there is abundant proof. Firing is the safest, and, therefore, the usual plan adopted for spavin, and on the first intimation of the disease it is often adopted without any necessity for having recourse to so disfiguring a process. Its chief advantage is, that while it is a certain means of establishing a strong counter-irritation, it has no tendency to cause any increase of inflammation in the structures beneath the skin, and therefore the good it does is unalloyed by any counterbalancing evil. It is now the fashion to deny its use, and horsemasters are often tempted to try some substitute for it in the hope of escaping a blemish; but too often they are compelled to submit to it at last, and probably after the disease has been aggravated by some "unfailing" remedy. If there is a strong desire expressed to avoid a blemish, the veterinary surgeon is perfectly warranted in doing all in his power to effect a cure without the use of the irons; but the mere fashion of

the day should not induce him to deery a plan which has for so many years been proved to be successful. In human surgery the same course has been adopted, and for the last thirty or forty years the actual cautery has been voted "barbarous" in this country. Now, however, a counter current is setting in, and it is the general opinion of the first hospital surgeons of the day that, in certain diseases of the joints, no remedy is nearly so efficacious. All sorts of attempts are made to render the use of the hot iron less repugnant to the senses; but in the case of the horse it is only necessary to measure its comparative utility and the amount of pain which it gives. The former has been already considered, and as to the latter, if the irons are properly heated, I much doubt whether their action is not less painful than that of any other counter-irritant. Setons, perhaps, give less pain if skilfully inserted, and they are admirable remedies, having nearly the same beneficial effects as firing, and leaving a far slighter blemish. They should be passed beneath a considerable track of the skin, covering the "spavin place," and the tape requires to be smeared with blistering cerate to produce sufficient irritation. Their use by themselves is often sufficient, but when preceded by subcutaneous scarification they seem to act even more certainly than firing.

The method of operation is similar to that described for splints, but it requires more knowledge of the anatomy of the parts to avoid doing mischief by cutting into one of the joints. There is always afterwards considerable effusion into the subcutaneous cellular membrane, demanding two or three months for its removal; but as the spavined horse requires that interval of rest, this is of little or no consequence. When the disease has gone so far that no method of treatment will remove it, the nerve above the hock may be divided, which will enable the horse to work without pain for a time, but the disease goes on the faster, and the benefit derived is only temporary.

Mr. Holmes, of Beverly, has obtained great celebrity for his treatment of spavin on this plan, and undoubtedly not without foundation. Some of his cures have been very remarkable, as even old standing and extensive growths of bone have been reduced, and the hocks have remained sound afterwards.

EXOSTOSIS OF THE HUMERUS AND SCAPULA.

THE HEADS OF THE BONES adjacent to most of the joints of the body are more or less subject to exostosis, though not so frequently as those of the pastern bones and tarsus. Next to these probably comes the shoulder joint, the neighborhood of which is often the seat of this disease. The left scapula and humerus of a horse are often completely ankylosed, and of course there co-exists a proportionate

amount of lameness during the progress of the disease, while after the ankylosis takes place the want of action is complete. An examination by the hand of the point of the shoulder would readily detect so large a growth of bone as this; but smaller ones are often thrown out beneath the mass of muscles surrounding the shoulder joint, and consequently beyond the reach of the most accomplished finger. The *treatment* should be on the same principle as for spavin, omitting the subcutaneous scarification, which is not here practicable on account of the nature of the joint. Blisters, and especially with the biniodide of mercury, will be the most likely to succeed, but in most cases the cure will be only partial.

FISTULA OF THE WITHERS.

WHEN A SADDLE has been allowed to press upon the spinous processes of the dorsal vertebræ, it produces inflammation, which, if neglected, leads to the formation of an abscess. But the situation of the part is such that the matter cannot escape, even if the skin over the points of the bones is perforated, and it has a tendency, by the force of gravity, to burrow down among the muscles which connect the shoulder-blade with the trunk. The consequence is, that there is extensive inflammation, and often lameness of the shoulder, which could readily have been prevented by using proper care before the mischief was done, or removed by the adoption of suitable treatment afterwards before the disease is confirmed.

The *symptoms* in the early stage (that is, before a fistula is established) are merely an enlargement of the ends of the spinous processes, accompanied by heat and tenderness, but these go on until an abscess forms, which may be known to the touch by the fluctuating nature of the sensation which it gives on pressure by the fingers of each hand. As soon as this is made out, an opening should be made as low down as possible on the right side, taking care that it will allow all the matter to run out as fast as it forms. The reason why the right side should be chosen is, that most horses lie down on that side; but if the subject of fistulous withers is in the habit of lying on the left side, the opening should be made there in preference. When an actual fistula has been established, and the matter points before or behind the shoulder-blade, a sufficiently large opening should at once be made, taking care again that there is no pouch below it which will permit any accumulation. It is better to divide even important muscles than to suffer this to exist. In recent cases the establishment of this dependent opening will alone suffice to effect a cure; but in those of long standing, the lining of the fistulous passage

or passages has become converted into a substance almost resembling cartilage, and refuses to throw out healthy granulations, so as to lead to adhesion of its walls. Here a stimulus must be applied to their interior, which may be either mechanical, in the shape of a seton tape passed through from end to end and left there, or chemical, by means of injections. The latter are best composed of chloride of zinc diluted with water. One drachm of this should be mixed in a pint of water, and carefully injected into every part of the sinus twice or thrice a week.

POLL EVIL.

POLL EVIL is exactly similar in its nature to fistulous withers, being produced by a blow on the prominent ridge, which is situated on the top of the poll. The blow is generally produced in the stable, by the horse suddenly lifting his head and striking it against a low beam or the lintel of the door. Or it may be caused by frequently straining against the halter rein, and thus producing irritation and inflammation of the part. As the ligamentum colli is attached above, and anterior to, the inflamed part, when matter forms it is confined and gives intense pain; besides which, it is a long time before it opens a passage by natural means. The *symptoms* are a painful swelling on the poll, of a soft nature, accompanied by the sense of fluctuation on examination, just like that described as accompanying fistulous withers. The *treatment* must be precisely similar to that described in the last section; but as the matter when formed lies very close to the spinal cord, some caution must be exercised in adopting stimulating injections, which are apt to produce severe inflammation, likely to extend to these important structures. So also in opening it, the knife should not be carried deeply into the situation of the spinal marrow, which here lies exposed, and is easily divided (as in the operation known by the name of pithing), but it should be used in a slanting manner, again selecting the right side in preference to the left. A seton is here the safest plan for promoting granulation and adhesion, and as the fistulous track is seldom very long, the tape will work its way gradually out, by which time the cure is effected.

CARIES OF THE JAW.

THE UPPER JAW, FROM ITS EXPOSED SITUATION, and the lower from the same cause, and also from the abuse of the bit, are liable to mechanical injury, which ends in caries (ulceration), or sometimes in necrosis (mortification) of the part. Caries of the lower jaw, between the tushes and grinders, is extremely common, owing to the barbarous punishment which is inflicted by the use of long levers to curb bits, together with light curb chains. The bony plate forming the roof of the mouth is also often injured

by the pressure of the part when a tight noseband is employed to keep the mouth shut. Either may be known by the existence of a sore of a peculiar character ; there is a depression indicating a loss of substance, and in this lies a mass of unhealthy granulation (proud flesh), *which is not attached to the surrounding surface, being only fixed to the bottom of the cavity*, or perhaps partially on one side. A watery and offensive discharge goes on constantly, but this is lost in the saliva, and very often the only circumstance that draws attention to the disease is the constant bleeding from the mouth, on the slightest contact of the bit. When this occurs, the mouth being full of *pink* froth, it should be carefully examined, and the state of things here described will generally be found to exist. The *treatment* should consist in the adoption of a bit pressing upon another part of the mouth, changing the curb for a snaffle. The wound should be kept open by the use of caustic (lunar) daily, which should be pushed deeply into it for couple of seconds, and will destroy the unhealthy granulations. By continuing these measures, taking care not to do more with the caustic than necessary to keep down the fungous growth, a cure can always be effected in course of time, without the aid of the trephine or chisel to cut away the diseased bone.

OSTEO SARCOMA.

THE JAWS are occasionally attacked by a malignant growth from their cellular structure of a substance partaking of the nature both of cartilage and bone. It increases sometimes to an enormous size, and forms a large irregular tumor, which interferes terribly with their functions, often growing so as to prevent the closure of the teeth. The *symptoms* are entirely local, and when a large, unwieldy, and irregularly hard swelling on either of the jaws is met with, it may safely be set down as belonging to this class of disease. No *treatment* is of any avail except excision, which can rarely be carried through without rendering the horse unserviceable for his ordinary duties.

FRACTURES.

BONES are not unfrequently broken in the horse ; but as the accident generally occurs either during the violent exertion of the muscles of the limb, or from great external force, it follows that in most cases the injury to the soft parts is so great as to forbid the hope of a perfect reparation. When, for instance, a cannon or pastern bone gives way during the shock sustained in coming down

on hard ground from a leap, either at the moment of the fracture or before the horse can be stopped, the upper end pierces the skin, and also tears or bruises the tendons which alone connect it to the part below. In surgical language, the fracture is a compound one; and from the great tendency to contraction of the muscles, the difficulty of bringing the disunited ends into apposition (or setting them) is immense. Moreover, the horse is very unmanageable when an attempt is made to confine him, and the means which are adopted to keep the fracture set must therefore be very complete as compared with those which will serve for the restoration of the human being who has sustained a similar accident. Hence, unless the animal is wanted for stud purposes alone, or unless the fracture is a simple one, with little displacement, it will seldom be worth the attempt to procure the union of a broken bone in the horse. Many cases are on record in which after a fracture of a canna or pastern bone a complete cure has been effected, but they must be considered as exceptional, and not as affording as much encouragement.

THE SYMPTOMS OF SIMPLE FRACTURE are a greater or less degree of deformity of the limb, swelling, pain on motion, and a peculiar grating or jarring which is felt rather than heard, and which has received the name of "crepitus." The last symptom can only be made out when the broken ends of the bone can be brought together; but when this is impossible, the alteration of form is in itself sufficient to lead to a detection of the nature of the accident. In fractures of the head and spine there is no crepitus felt, and the effect upon the brain and spinal cord of pressure will be often the sole means of coming to a correct diagnosis. Fractures of the pelvis are very difficult to make out, unless the ala of the ilium is broken off, which is a common accident, for here the unnatural flatness of the hip, showing itself without any great difficulty of moving the hind leg of that side, plainly marks that there is no dislocation, and that the case can only be one of fracture. It is always the result of a blow, either when the horse is cast in a stall or in passing through a narrow door-way, or from a similar cause; and there will therefore be some swelling of the soft parts which will interfere with the examination at the time, but as nothing can be done to restore the broken portion to its place, and as there is no doubt about the diagnosis from dislocation, this is of little consequence. Fractures of the ribs cannot be readily detected; but as they almost always follow a kick on the part, and as they do not require any treatment unless their broken ends press upon the important viscera of the thorax or abdomen, it will be well to wait for the symptoms which are caused by this mechanical irritation before resorting to bandages, &c. When a fracture occurs in any of the bones of the

extremities, which are concealed by a large mass of muscle, the total inability to use the limb, and the loose way in which it is connected to the body, so as to allow it to be moved in any direction, indicate the general nature of the case without difficulty, though a careful examination must be made by a skilful surgeon before the exact particulars relating to it can be ascertained.

The treatment will depend upon the bone which is broken, and whether the fracture is simple or compound. In most cases of the latter description none will avail, and the horse had better be destroyed; but if the owner is averse to this, it will be on the whole the best surgery, though apparently not very scientific, to encase the parts with adhesive plasters and tow, and then treat it as a simple fracture.

IF THE BONES OF THE SKULL are fractured, unless there are symptoms of pressure on the brain, it is advisable to leave all to nature, simply keeping the patient quiet and low, and if in a high state of plethora, bleeding and physicking.

A BROKEN LOWER JAW is by no means uncommon as the result of a kick. The best treatment is to set the fracture, and then mould some gutta percha to it, which may be confined behind by strips round the forehead and poll, and before by a padded strap passed through the mouth between the nippers and tushes, and beneath the tongue. The horse must be fed upon mashes and steamed food.

IN FRACTURES OF THE SPINE AND PELVIS nothing can be done beyond rest and lowering, if necessary, by bleeding and physic.

BROKEN RIBS, when they cause inflammation of the lungs or liver by their sharp ends pressing upon these organs, may be treated by buckling two or three ordinary rollers abreast of one another tightly round the chest, so as to prevent the natural dilatation of the thorax, which takes place in inspiration, and which keeps up the irritation by constantly moving the ends of the ribs. The general means necessary to adopt to relieve the internal mischief will depend upon its extent.

WHEN EITHER THE SCAPULA, HUMERUS, OR FEMUR is broken, all that can be done is to sling the horse, and by bandages endeavor to bring the limb into as natural a position as possible, and keep it there. There must of necessity be great displacement of the ends of the bones, and these cannot by any means be brought into apposition; but the sides in contact with one another, as they override, will unite in course of time, and this is all that can be achieved by the utmost efforts of the veterinary surgeon.

FRACTURES of the lower part of the tibia, of the radius, of the canna bones and the pasterns, if simple, must be treated by adjusting the ends (which is the chief difficulty, and will often require strong extension to be employed), and then adapting to the sides

of the bones splints of wood or gutta percha. If, by the aid of assistants, the parts can be brought into a good position, these may be carefully adjusted to maintain it, and may be kept in place by tapes or straps fastened moderately tightly around them. It is useless, however, to attempt a minute description of the means to be employed, which can hardly be understood without a demonstration. Many horses have recovered a fair use of the limb by the application of splints, without slinging, as they will take care to avoid resting on that foot in consequence of the pain it gives; but under the care of an accomplished veterinary surgeon, slings will afford the best chance of recovery.

CHAPTER II.

INJURY AND DISEASES OF THE JOINTS, MUSCLES, AND TENDONS.

Diseases of Muscle, Tendon, and Ligament—Of Cartilage and Synovial Membrane—Inflamed Tendinous Sheaths—Inflamed Bursa Mucosa—Strains—Those of the Back and Loins—Of the Shoulder—Of the Knee—Of the Fetlock—Of the Coffin Joint—Of the Suspensory Ligaments—Of the Back-Sinews—Breaking Down—Strains of the Hip-Joint, Stifle, and Hock—Curb—Dislocation—Wounds of Joints.

DISEASES OF MUSCLE, TENDON, AND LIGAMENT.

MUSCLE is subject to simple atrophy, with or without fatty degeneration. The disease shows itself by a wasting away of the part, accompanied by a flabby feel to the touch. It should be treated by friction, gentle but regular work, and steel given internally, one drachm of the sulphate of iron powdered being mixed with the corn twice a day.

RHEUMATIC INFLAMMATION of a muscle or muscles is one of the most common of all the diseases to which the horse is subject. Most frequently it attacks the muscles of the shoulder, or of the loins, sometimes both those parts being involved at the same time. When *acute* it receives the name of a *chill*, and is generally brought on by exposing the horse to a draught of air after work, or by immersing him in cold water up to his belly, with a view either to refresh him, or when the groom is lazy, to save him the trouble of cleaning. The symptoms are lameness or inability to use the part, the horse, when forced to do so, giving expressions of severe pain. If the shoulder is affected, the foot is not put to the ground, and when the leg is moved backwards and forwards by the hand, great

pain is evidently experienced. In severe cases there is fever with accelerated pulse (70 to 80), accompanied often by profuse sweating, and heaving at the flanks, the legs remaining warm. After a short time the part swells, and is excessively tender. The *treatment* should be by a copious bleeding, if the horse is of a moderately strong constitution; indeed, in severe cases it should be carried on till the pulse is greatly reduced, and repeated the next day, if it returns to its original hardness and fulness. The bowels should be acted on as soon as it is safe to do so, and if the dung is very hard, backraking and clysters should be used, to accelerate the action of the medicine. The best aperient is castor oil, of which a pint may be given with an ounce of sweet spirits of nitre. When this has acted, if the kidneys are not doing their duty, a quarter of an ounce of nitre and a drachm of camphor may be made into a ball and given twice a day.

CHRONIC RHEUMATISM of the muscles is similar in its nature to the acute form, but, as its name implies, it is more lasting, and of less severity. It often flies from one part to another, attacking the ligaments and tendons, as well as the muscular fibres. It is seldom much under control, and attention should be paid rather to improve the general health than to subdue the local affection.

SMALL TUMORS, of about the size of a pea, often form upon the tendons, especially the "back sinews" of the fore legs. They may or may not occasion lameness, but they are always to be regarded with suspicion. As long as they remain indolent, they are better left alone; but when they produce inflammation and pain, the best remedy is the biniodide of mercury ointment, described at page 300.

DISEASES OF CARTILAGE AND SYNOVIAL MEMBRANE.

CARTILAGE is subject chiefly to ulceration. When this occurs, its cells become enlarged and crowded with corpuscles, which burst and discharge their contents; the intercellular structure at the same time splits into bands, which, together with the corpuscles, form a fibro-nucleated membrane on the face of the cartilage. In old horses, the ulcerated cartilage covering the tibial surface of the astragalus is sometimes converted into a soft fibrous substance, which ultimately assumes the appearance of hard and dense bone, commonly known as "porcellaneous or ivory deposit." It is accompanied by no symptoms of inflammation; the sole evidence of disease, during life, being a stiffness of the joint, and a peculiar grating or crackling noise during all attempts at movement. When caries of the head of a bone has caused a loss of substance, the cartilage dies, and is gradually broken down by decomposition: but this cannot be said to be a disease of the cartilage itself. With the exception of navicular disease (which will be included under

the diseases of the foot), ulceration of cartilage is not very common in the horse.

ACUTE INFLAMMATION OF THE SYNOVIAL MEMBRANE is seldom met with; but a chronic state, inducing an excessive secretion of synovia, is extremely common. The most usual situation is at the hock, where the swelling has received the name of *bog-spavin* and *thoroughpin*; but they also occur at the fetlock and knee joints; in the former case being sometimes confounded with windgalls, which are inflamed *bursæ mucosæ*.

BOG-SPAVIN is very apt to attack young horses, when they are over-worked, before being fully seasoned; but it may occur at all ages. It shows itself at the inner side of the joint, because here the ligaments are wider apart, and there is more room for distension. Its seat is the capsule between the tibia and astragalus, which is here unprotected by any strong fibrous covering, and readily yields to the gradual pressure of the secretion from its internal surface.

THOROUGHPIN may be either an increased secretion of the synovial capsule, between the astragalus and os calcis, or between the scaphoid and cuneiform bones, or of the bursa mucosa lying between the tendo Achillis and the tendo perforatus. In the first of these cases, it often coexists with *bog-spavin*, and the synovia may be made to fluctuate from one bag to the other, the only line of demarcation being the astragalo-calcanean ligament.

Both bog-spavin and thoroughpin may exist, or either separately, without occasioning lameness; but where they are just established, there is generally some small degree of active inflammation, which causes a slight lameness on first going out of the stable, but soon disappearing.

The treatment should be by pressure, kept up for a long time, by means of a carefully-adjusted truss, alternated with cold affusion, and the use afterwards of tincture of arnica, diluted with water, as a wash. Subcutaneous scarification has succeeded in some few cases in causing the secretion to cease; but it has so often produced extensive inflammation of the joint, that the operation is by no means to be recommended. Blistering with biniodide of mercury has also occasionally answered; but no plan is so successful, on the whole, as pressure, alternating with cold affusion.

DELICATE YOUNG FOALS are subject to a rheumatic inflammation of their synovial membranes, specially displayed in the knees and hocks, and apparently caused by exposure to cold. It seldom goes on to produce disorganization of the cartilages, but the capsular ligaments are distended with thin yellow synovia, causing considerable stiffness. The cellular tissue around the joints also becomes oedematous, and the legs fill all the way down to the feet. It is commonly known among breeders as the "joint evil," and

though in itself it is not dangerous, yet it marks the existence of constitutional weakness which is likely to occasion some more fatal malady. The *treatment* should consist in attending to the general health by strengthening the mare, which is best done by giving her a drachm of the sulphate of iron in her corn twice a day. The joints of the foal should be rubbed with equal parts of soap liniment and spirit of turpentine, and it should be assisted to stand for the purpose of sucking at regular short intervals if unable to help itself. In aggravated cases, however, the foal is not likely to recover its general strength, and it may be better to destroy it, but so long as it can stand and feeds well hopes may be entertained of the joints recovering.

INFLAMED TENDINOUS SHEATHS.

EVERY PRACTICAL HORSEMAN is aware that the sheaths in which the back sinews and other tendons are lodged are liable to inflammation and thickening, without the tendon itself being involved. By passing the hand down the leg, an irregular network may be felt surrounding the tendons, which move up and down without disturbing it; and the surrounding cellular membrane is also thickened, and becomes hard and unyielding. There may be considerable heat about the part, but often it is quite cool; and the disease may continue for months without any great lameness, and with nothing to draw attention to it (excepting a slight stiffness on leaving the stable) but the sensation communicated to the hand. At length, an unusually severe day's work sets up active inflammation, the leg rapidly fills, and there is so much lameness as to cause the horse to be thrown by.—The *treatment* in the early stage, should be the use of bandages, constantly kept wet with arnica and water, and nothing but walking exercise. After the thickening is fully established, no remedy short of blistering, or a charge, will be of the slightest avail, with a rest of two or three months.

INFLAMED BURSÆ MUCOSÆ.

THESE SYNOVIAL BAGS are liable to inflammation, either from hard work, as in windgalls and thoroughpin, or from blows, as in capped hock and elbow. The latter are said by some veterinarians to be serous abscesses; but there is no doubt that in all horses a subcutaneous bursa exists on the cap of the elbow and hock; and these become inflamed and filled with a very thin synovia, when they are bruised. They never extend beyond a certain size, and have no tendency to burst; nor are they inclined to a healthy termination of their own accord, but go on in the same condition from year to year.

WINDGALLS, OR PUFFS, are the most usual forms of these en-

enlargements, and may be observed in the legs (hind as well as fore) of nearly every hard-worked horse, after a time. Great care in the management of the legs by bandaging will sometimes keep them off, and some horses have naturally no tendency to form them; but in most cases, on examining the legs, just above the fetlock joints, of horses at work, a little oval bag may be felt on each side, between the back-sinew and the bone. If recent, it is soft and puffy; but if the work is hard, and the windgall is of long standing, it will be as tense as a drum. The synovial bag has no communication with the fetlock joint; but there is another sac in front of the joint, and beneath the tendons of the extensors, which is often enlarged, though not so much so as the seat of the true windgall, and which is generally, though not always, continuous with the synovial capsule of the joint.—The *treatment* consists in pressure by means of bandages, and the application of cold lotions, if the legs are hot and inflamed. Blistering and rest will remove them entirely; but no sooner is the horse put to work again, than they return as badly as ever. There is no radical cure but subcutaneous puncture and scarification, and this will produce too much adhesion to be advantageously applied.

THE FORM OF THOROUGHPIN in which the bursa mucosa between the tendo Achillis and the tendo perforatus is inflamed and filled with synovia, has been alluded to at page 313, and its *treatment* is there described.

CAPPED HOCK is often the result of a bruise of the superficial bursa, which is situated on the point of the hock, immediately beneath the skin. It indicates either that the possessor has kicked in the stable or in harness; but it is more frequently caused in the former way than in the latter. The swelling is sometimes slight, being then just sufficient to show the point slightly enlarged, and to give a soft, puffy sensation to the fingers, where there ought to be nothing but bone felt beneath the skin. The bursa always rolls freely on the bone, and when large, it can be laid hold of and shaken like a bladder of water.—The *treatment* should be directed to abate any slight inflammation that may exist, if the case is established; but in recent ones, it is doubly necessary to apply cold lotions, which, however, there is some difficulty in doing, owing to the prominent nature of the part. A piece of stout calico or fine canvas may, however, be shaped into a cap, carefully fitting the point of the hock; and this being tied by several pieces of tape in front of the leg, will allow not only of the application of cold lotions, but of pressure also. By this plan, continued for some weeks, considerable enlargements have been removed, but they are very apt to return on the slightest bruise. Setons through the bursa, and injections into its cavity of stimulating applications, have often been tried; but they generally do more harm than

good, and nothing can be relied on but the conjoint use of pressure and cold applications. The best lotion is the following:—

Take of Tincture of Arnica	3 ozs.
Muriate of Ammonia	2 “
Methylated Spirit of Wine	4 “
Water	3 pints. Mix.

CAPPED ELBOW is precisely similar in its nature to capped hock, and must be treated in the same way. It is also known by the name of capulet.

OF STRAINS.

THE FIBRES OF MUSCLES, LIGAMENTS, AND TENDONS, AND THE FASCIA covering them, are all liable to be overstretched, and more or less mechanically injured. This is called a strain, the *symptoms* of which are similar to the inflammation of the part occurring ideopathically. They are heat, swelling, and pain on pressure or movement, shown by flinching in the one case, and lameness in the other. In some cases there is considerable effusion of blood or serum, the former occurring chiefly in the muscles, and the latter among the torn fibres of the tendons or ligaments. The *symptoms* and *treatment* will depend upon the part injured, which will be found described under the following heads; but in most cases an embrocation composed of equal parts of laudanum, olive oil, spirit of turpentine, and hartshorn, will be beneficial if applied after the first active inflammation has subsided.

STRAIN OF THE BACK AND LOINS.

WHEN A YOUNG HORSE has been hunted or ridden with hounds over any kind of fence, he is very apt to over-exert himself in his awkward attempts to clear the obstacle, and next day he will often show a stiffness of the loins and back, which is seated in the large muscles connecting the pelvis with the thorax. He is said to have “ricked his back,” in the language of the stable, and if the mischief is confined to the muscles alone, he may generally be permanently cured, though he will be more liable to a return than an animal which has never suffered from any accident of the kind. If, however, the spinal cord is injured, either from fracture of the vertebræ, or from effusion of blood or serum pressing upon it, the case is different, and a perfect cure is seldom obtained. It is, however, very difficult to form a correct diagnosis between the one case and the other, and the treatment may generally be conducted with the hope that the more important organ is uninjured. When there is complete palsy of the hind extremities, so that the horse can neither feel nor use them in the slightest degree, the case is hopeless. For the management of the strain of the loins, a full bleeding should be adopted, as it generally happens that the horse

is plethoric and full of corn. Then apply a double fold of thick flannel or serge, dipped in warm water, to the whole surface of the loins, cover this over with a layer of indiarubber sheeting, and let it remain on, taking care to renew the water if it has become dry. It generally produces a copious sweating from the part, followed by a slight irritation of the skin, both of which afford relief. In three or four days the flannel may be removed, and the embrocation alluded to above rubbed in two or three times a day, which will generally relieve the muscles so much that at the end of a week or ten days the horse is able to move quietly about in a loose box, and the cure may be left to time, aided by a charge on the back.

STRAIN OF THE SHOULDER.

SHOULDER STRAIN was formerly very often chosen as the seat of lameness in the fore extremity, solely because the case is so obscure that it is beyond the knowledge of the unskilful examiner. Nevertheless, it is by no means so uncommon as is supposed by some writers, and perhaps it may be asserted that it is now more frequently passed over when it really exists, than the reverse. It generally is seated in the serratus magnus, or pectoralis transversus muscles, but it may also occur in the triceps, or, indeed, in almost any of the muscles around the shoulder joint. The *symptoms* are very peculiar, and cannot well be mistaken by a careful observer who has once seen a case of shoulder lameness. In all other kinds (except the knee), the limb is freely moved while in the air, and no pain is expressed until the foot is about to touch the ground; but here the lameness is greatest while the knee is being protruded, and the limb is slung forward sideways, in a circular manner, which gives an expression of great imbecility. It also occasions great pain when the foot is lifted and drawn forward by the hand, just as in rheumatism of the part (already described at page 312). When the serratus magnus has been strained by a fall from a drop leap, or the pectoralis transversus by a slip, causing the legs to be widely separated, there is often great obscurity in the case; but the history of the accident will generally assist in forming a correct diagnosis. The *treatment* in the early stage will consist in bleeding from the plate vein, to the extent of five or six quarts of blood, followed by fomentations with hot water, if there is much heat and swelling, and giving a dose of physic as soon as the bowels will bear it. When the heat has disappeared, or at once, if there is none, apply the embrocation described at page 315; and if this does not produce relief, add to it one quarter of its bulk of tincture of cantharides.

STRAINS OF THE KNEE.

THE KNEE, unlike its analogue in the human subject (the wrist)

is seldom strained in the horse, in consequence of the strong ligaments which bind the bones of the carpus together. Still it sometimes happens that the internal lateral ligaments are overstretched, or, in calf-kneed horses, the posterior common ligaments, or that connecting the scaphoid with the pisiform bone, or probably all these will suffer from over-extension. The accident may be recognised by the heat and swelling of the part affected, as well as by the pain given on using the joint. The anterior ligaments are seldom strained, but are liable to injury from blows received in various ways. The *treatment* should be conducted on the same principles as those of strains in the shoulder. Cold applications will seldom do anything but harm in the early stage; but after hot fomentations have relieved the active mischief, by encouraging the effusion of serum into the surrounding cellular membrane, the former may be used with advantage. When the heat and other signs of active inflammation have disappeared, the biniodide of mercury ointment may be rubbed in, avoiding the back of the joint.

STRAIN OF THE FETLOCK.

THIS ACCIDENT shows itself at once, in consequence of the superficial nature of the joint, by swelling, heat, soreness to the touch, and lameness. It may be very slight or very severe, but in the latter case it is generally complicated by strain of the back sinews, or suspensory ligament. The *treatment* will be precisely on the same plan as for strain of the knee. When the anterior ligaments of the fetlock joint are strained and inflamed, as so often happens with race-horses, the condition is known as "shin sore."

STRAIN OF THE COFFIN JOINT.

DISSECTION PROVES that this joint is sometimes the seat of strain; but it is almost impossible to ascertain its existence with certainty during life. The diagnosis is, however, not of much consequence, as the *treatment* will be the same, whether the coffin joint, or the navicular joint is the seat of the mischief. In any case, if severe, bleeding from the toe should be had recourse to, followed by cold applications around the coronet, by means of a strip of flannel or felt, tied loosely around the pastern, and kept constantly wet. When the heat has subsided the coronet should be blistered.

STRAIN OF THE SUSPENSORY LIGAMENTS.

THE SUSPENSORY LIGAMENT not being elastic like the back sinews (which, though not in themselves extensible, are the prolongations of muscles which have that property), is very liable to strains, especially in the hunter, and to a less degree in the race-horse. The accident is readily made out, for there is local swelling

and tenderness, and in the well-bred horse, which is alone likely to meet with a strain of this kind, the leg is rarely sufficiently gummy to prevent the finger from making out the condition of the ligaments and tendons. There is no giving away of the joints as in "break-down," but on the contrary the leg is flexed, and if the case is a bad one, the toe only is allowed to touch the ground. In ordinary cases, however, there is merely slight swelling of the suspensory ligament in a limited spot usually near its bifurcation, or sometimes in one division only close above the sesamoid bone to which it is attached. The horse can stand readily on that leg, but on being trotted he limps a good deal. Sometimes, however, there is a swelling of the feet without lameness, but in this case the enlargement is generally due to an effusion of serum into the cellular covering of the ligament, and not to an actual strain of its fibres.—The *treatment* will depend greatly upon the extent of the mischief; if there is no great injury done, and the enlargement is chiefly from effusion of serum, rest and cold applications by means of bandages or otherwise will in the course of two or three months effect a cure. Generally, however, the case will last six or eight months before the ligament recovers its tone; and in a valuable horse no attempt should be made to work him before that time. Where the swelling is small, as it generally is, bandages have no power over it, as the projection of the flexor tendons keeps the pressure off the injured part. Here, dipping the leg in a bucket of water every hour will be of far more service than a bandage, and the sudden shock of the cold water will be doubly efficacious. After all heat has disappeared the biniodide of mercury may be used as a blister two or three times, and then the horse may either be turned out, or put into a loose box for three or four months, after which walking exercise will complete the cure.

STRAIN OF THE BACK SINEWS.

IN THIS ACCIDENT the position of the leg is the same as in strain of the suspensory ligament, and there is no giving way of the joints. The flexor tendons are enlarged, hot, and tender, and there is great lameness, the horse having the power to flex the joints below the knee, but resolutely objecting to extend them, by bearing what little weight is unavoidable upon his toe. The case is often confounded with a "break-down," but it may readily be distinguished by the fact that in the latter the joints give way on putting the weight upon them, whilst in mere strains they do not, and the tendency is to the opposite extreme. Frequently after a bad strain of the flexor tendons, the fetlock is "over shot," or beyond the upright, in consequence of the continued flexion of the joint, to prevent pressure upon the injured fibres, and in the management this result should be carefully guarded against. The injury

is generally confined to the sheath of the tendons, which in most cases gradually puts on an inflammatory condition for some time before actual lameness is observed. In bad cases, however, the ligamentous fibres which are given off by the posterior carpal ligament to the flexor tendons are ruptured, greatly increasing the amount of inflammation and subsequent loss of strength. In any case the tendon feels spongy, and slightly enlarged, and there is more or less soreness on pressure and on being trotted, but in the latter case exercise removes the tenderness, and very often temporarily causes an absorption of the effused fluid, which is again deposited during rest. This state of things goes on for a time, the groom doing all in his power to alleviate it by wet bandages, &c., but at last a severe race or gallop brings on an extra amount of inflammation, with or without actual strain of the fibres of the tendon, and then there can be no doubt about the propriety of rest and severe treatment. It often happens that both legs are slightly affected, but one being more tender than the other, the horse attempts to save it by changing legs, the consequence of which is that the comparatively sound tendons are strained, and he returns to his stable with both legs in a bad state, but with one of them requiring immediate attention.—The *treatment* should be by local bleeding (from the arm, thigh, or toe), followed at first by warm fomentations, and in a few days by cold lotions. A high-heeled shoe (called a patten) should be put on the foot, so as to allow the horse to rest part of the weight upon the heel without distressing the tendon, and this will have a tendency to prevent him from over shooting at the fetlock joint, which he will otherwise be very apt to do from constantly balancing his leg on the toe. After three or four days the hot fomentations will have done what is wanted, and a cold lotion may be applied by means of a loose linen bandage. The best is composed as follows:—

Take of Muriate of Ammonia	2 oz.
Vinegar	$\frac{1}{4}$ pint.
Methylated Spirit of Wine	$\frac{1}{4}$ pint.
Water	2 quarts. Mix.

With this the bandage should be kept constantly wet, the application being continued for a fortnight at least, during which time the patient must be kept cool, by lowering his food, and giving him a dose of physic. At the end of three weeks or a month from the accident, the leg must be either blistered or fired, the choice depending upon the extent of injury, and the desire to avoid a blemish if such a feeling exists. The former is the more efficacious plan no doubt, but blistering will frequently suffice in mild cases. If, however, the tendons at the end of a month continue greatly enlarged, a cure can hardly be expected without the use of the “irons.”

BREAKING DOWN.

GREAT CONFUSION exists among trainers as to the exact nature of this accident, which is considered by the veterinary surgeon to consist in an actual rupture of the suspensory ligament either above or below the sesamoid bones, which, in fact, merely separate this apparatus of suspension into two portions, just as the patella intervenes between the rectus femoris and the tibia. Whichever part of the suspensory apparatus is gone (whether the superior or inferior sesamoidal ligament is immaterial), the fetlock and pastern joints lose their whole inelastic support; and the flexor tendons, together with their ligamentous fibres which they receive from the carpus, giving way, as they must do, to allow of the accident taking place, the toe is turned up, and the fetlock joint bears upon the ground. This is a complete "break down;" but there are many cases in which the destruction of the ligamentous fibres is not complete, and the joint, though much lowered, does not actually touch the ground. These are still called breaks down, and must be regarded as such, and as quite distinct from strains of the flexor tendons. The accident generally occurs in a tired horse, when the flexor muscles do not continue to support the ligaments, from which circumstance it so often happens in the last few strides of a race. *The symptoms* are a partial or entire giving way of the fetlock joint downwards, so that the back of it either touches the ground, or nearly so, when the weight is thrown upon it. Usually, however, after the horse is pulled up, he hops on three legs, and refuses altogether to put that which is broken down to the ground. In a very few minutes the leg "fills" at the seat of the accident, and becomes hot and very tender to the touch. There can, therefore, be no doubt as to the nature of the mischief, and the confusion to which allusion has been made is one of names rather than of facts. *Treatment* can only be directed to a partial recovery from this accident, for a horse broken down in the sense in which the term is here used can only be used for stud purposes or at slow farm work. A patten shoe should at once be put on after bleeding at the toe to a copious extent, and then fomentations followed by cold lotions should be applied, as directed in the last section. As there must necessarily be a deformity of the leg, there can be no objection on that score to firing, and when the severe inflammation following the accident has subsided this operation should be thoroughly performed, so as to afford relief not only by the counter irritation which is set up, and which lasts only for a time, but by the rigid and unyielding case which it leaves behind for a series of years.

STRAINS OF THE HIP JOINT, STIFLE, AND HOCK.

THE HIP JOINT, OR ROUND BONE, is liable to be strained by the hind feet slipping and being stretched apart, or by blows against the side of the stall, when cast, which are not sufficient to dislocate the femur, but strain its ligaments severely. The consequence is an inflammation of the joint, which is evidenced by a dropping of one hip in going, the weight being thrown more upon the sound side than upon the other. This is especially remarkable on first starting, the lameness soon going off in work, but returning after rest. The case, however, is a rare one, and its description need not, therefore, occupy much of our space. When it does happen, it is very apt to lead to a wasting of the deep muscles of the haunch, which nothing but compulsory work will restore to a healthy condition. The only *treatment* necessary in the early stage of strain of the hip joint is rest and cooling diet, &c.; but, after six weeks or two months, a gradual return to work is indispensable to effect a cure.

STRAINS OF THE STIFLE, independently of blows, are rare; but the latter often are inflicted upon this joint in hunting, leaving little evidence externally, so that it is almost always doubtful whether the injury is the result of a blow or strain. The *symptoms* are a swelling and tenderness of the joint, which can be ascertained by a careful examination; and on trotting the horse, there is manifested a difficulty or stiffness in drawing forward the hind leg under the belly. The *treatment* must be by bleeding and physicking in the early stage, together with hot fomentations to the part, continued every hour until the heat subsides. After a few days, if the joint is still painful, a large blister should be applied, or, what is still better, a seton should be inserted in the skin adjacent.

THE HOCK ITSELF is liable to strain, independently of the peculiar accident known as "curb." When it occurs, there is some heat of the part, with more or less lameness, and neither spavin, thoroughpin, nor curb to account for them. The injury is seldom severe, and may be relieved by fomentations for a day or two, followed by cold lotions, as presented at page 320, for strain of the back sinews.

CURB.

THE LOWER PART OF THE POSTERIOR SURFACE of the os calcis is firmly united to the cuboid and external metatarsal bone by two strong ligamentous bands, called the calcaneo-cuboid and calcaneo-metatarsal ligaments. The centre of these ligaments is about seven or eight inches below the point of the hock, and when a soft but elastic swelling suddenly makes its appearance there, it may

with certainty be asserted that a "curb" has been thrown out. The accident occurs somewhat suddenly; but the swelling and inflammation do not always show themselves until after a night's rest when the part is generally enlarged, hot, and tender. The precise extent of the strain is of little consequence; for whatever its nature, the treatment should be sufficiently active to reduce the ligaments to their healthy condition. Some horses have naturally the head of the external small metatarsal bone unusually large, and the hock so formed that there is an angle between the large metatarsal bone and the tarsus, leaving a prominence, which, however, is hard and bony, and not soft and elastic, as is the case with curb. Such hocks are generally inclined to throw out curbs; but there are many exceptions, and some of the most suspicious-looking joints have been known to stand sound for years. Curbs are seldom thrown out by very old horses, and usually occur between the commencement of breaking-in and the seventh or eighth year, though they are not unfrequently met with in the younger colt, being occasioned by his gambols over hilly ground. The *treatment* should at first be studiously confined to a reduction of the inflammation; any attempt to procure absorption till this is effected being injurious in the extreme. If there is much heat in the part, blood may be taken from the thigh vein, the corn should be removed, and a dose of physic given as soon as practicable. The curb should then be kept wet (by means of a bandage lightly applied) with the lotion recommended at page 316 for capped hocks, and this should be continued until the inflammation is entirely gone. During this treatment, in bad cases, a patten shoe should be kept on, so as to keep the hock as straight as possible, and thus take the strain off the ligaments which are affected. After the part has become cool, it may be reduced in size, by causing absorption to be set up; which is best effected by the application of mercury and iodine (both of which possess that power), in such a shape as to cause a blister of the skin. The biniodide of mercury has this double advantage, and there is no application known to surgery which will act equally well in effecting the absorption of a curb. It should be applied in the mode recommended at page 300, and again rubbed on at an interval of about a week, for three or four times in succession, when it will generally be found that the absorption of the unnatural swelling is effected; but the ligaments remain as weak as before, and nothing but exercise (not too severe, or it will inflame them again) will strengthen them sufficiently to prevent a return. Friction with the hand, aided by a slightly stimulating oil (such as neat's-foot and turpentine mixed, or neat's-foot and oil of origanum, or, in fact, any stimulating essential oil), will tend to strengthen the ligaments, by exciting their vessels to throw out additional fibres; and in course of time a curb may be

considered to be sufficiently restored to render it tolerably safe to use the horse again in the same way which originally produced it.

DISLOCATION.

By DISLOCATION is meant the forcible removal of the end of a bone from the articulating surface which it naturally occupies. In the horse, from the strength of his ligaments, the accident is not common; those that do occur being chiefly in the hip joint, and in that between the patella and the end of the femur.

DISLOCATION OF THE HIP JOINT is known by the rigidity of the hind leg, which cannot be moved in any direction, and is carried by the horse when he is compelled to attempt to alter his position. There is a flatness of the haunch below the hip, but the crest of the ilium is still there, and by this the accident may be diagnosed from fracture of that part. *No treatment* is of the slightest avail, as the part cannot be reduced, and the horse is useless except for stud purposes. The accident is not very common.

DISLOCATION OF THE PATELLA sometimes becomes habitual, occurring repeatedly in the same horse, apparently from a spasmodic contraction of the external vastus muscle, which draws the patella outwards, and out of the trochlea formed for it in the lower head of the femur. When the cramp goes off, the patella drops into its place again as soon as the horse moves, and no treatment is required. Occasionally, however, the dislocation is more complete, and nothing but manual dexterity will replace the bone in its proper situation. Great pain and uneasiness are expressed, and the operator must encircle the haunch with his arms and lay hold of the patella with both hands, while an assistant drags forward the toe, and thus relaxes the muscles which are inserted in it. By forcibly driving the patella into its place it may be lifted over the ridge which it has passed, and a snap announces the reduction.

WOUNDS OF JOINTS.

THE KNEE is the joint most frequently suffering from wound, being liable to be cut by a fall upon it, if the ground is rough; and if the accident takes place when the horse is going at a rapid pace, the skin, ligaments, and tendons may be worn through by friction against the plain surface of a smooth turnpike road. Whether the joint itself is injured, or only the skin, the accident is called a "broken knee," and for convenience sake it will be well to consider both under the present head.

WHEN A BROKEN KNEE consists merely in an abrasion of the skin, the attention of the groom is solely directed to the restoration of the hair, which will grow again as well as ever, if the

bulbs or roots are not injured. These are situated in the internal layer of the true skin, and therefore, whenever there is a smooth red surface displayed, without any difference in the texture of its parts, a confident hope may be expressed that there will be no blemish. If the skin is penetrated, either the glistening surface of the tendons or ligaments is apparent, or there is a soft layer of cellular membrane, generally containing a fatty cell or two in the middle of the wound of the skin. Even here, by proper treatment, the injury may be repaired so fully, that the space uncovered by hair cannot be recognised by the ordinary observer, and not by any one without bending the knee and looking very carefully at it. *The best treatment* is to foment the knee well with warm water, so as to remove every particle of grit or dirt; go on with this every hour during the first day, and at night apply a bran poultice to the knee, which should be left on till the next morning. Then cleanse the wound, and apply a little spermaceti ointment, or lard without salt, and with this keep the wound pliant until it heals, which if slight it will in a few days. If the skin is pierced there will generally be a growth *above it* of red flabby granulations, which should be carefully kept down to its own level (not beneath it), by the daily use of blue stone, or if necessary of nitrate of silver. As soon as the wound is perfectly healed, if the horse can be spared, the whole *front* of the knee and skin should be dressed with James' blister, which will bring off the hair of the adjacent parts, and also encourage the growth of that injured by the fall. In about three weeks or a month from its application, the leg will pass muster, for there will be no difference in the color of the old and new hair as there would have been without the blister, and the new will also have come on more quickly and perfectly than it otherwise would.

WHEN THE JOINT ITSELF is opened the case is much more serious, and there is a risk not only of a serious blemish, which can seldom be avoided, but of a permanent stiffness of the leg, the mischief sometimes being sufficient to lead to constitutional fever, and the local inflammation going on to the destruction of the joint by ankylosis. *The treatment* should be directed to cleanse and then close the joint, the former object being carried out by a careful ablution with warm water, continued until there is no doubt of all the dirt and grit having been removed. Then, if there is only a very small opening in the capsular ligament, it may be closed by a careful and light touch of a pointed iron heated to a red heat. Generally, however, it is better to apply some dry carded cotton to the wound, and a bandage over this, leaving all on for four or five days, when it may be removed and reapplied. The horse should be bled largely and physicked, taking care to prevent all chance of his lying down by racking him up

He will seldom attempt to do this, on account of the pain occasioned in bending the knee, but some animals will disregard this when tired, and will go down somehow. When the cotton is reapplied, if there are granulations above the level of the skin, they must be kept down as recommended in the last paragraph, and the subsequent treatment by blister may be exactly the same. By these means a very extensive wound of the knee may be often speedily cured, and the blemish will be comparatively trifling.

THE KNEE IS SOMETIMES punctured by a thorn in hunting, causing great pain and lameness. If it can be felt externally, it is well to cut down upon it and remove it; but groping in the dark with the knife among important tendons in front of the knee is not on any account to be attempted. The knee should be well fomented, five or six times a day, until the swelling, if there is any, subsides, and, in process of time, the thorn will either show its base, or it will gradually free itself from its attachments and lie beneath the skin, from which position it may be safely extracted with the knife.

CHAPTER III.

DISEASES OF THE THORACIC ORGANS AND THEIR APPENDAGES.

General Remarks—Catarrh—Influenza or Distemper—Bronchitis—Chronic Cough—Laryngitis—Roaring, Whistling, Etc.—Pneumonia and Congestion of the Lungs—Pleurisy—Pleurodynia—Phthisis—Broken Wind—Thick Wind—Spasm of the Diaphragm—Diseases of the Heart—Diseases of the Blood Vessels in the Chest and Nose.

GENERAL REMARKS.

THE IMPORTANCE OF SOUNDNESS in the respiratory apparatus is so fully recognised, that in common parlance it is put before the organs of locomotion, a popular expression being "sound, wind and limb." It is true that good wind is useless without legs; but the diseases of the latter are known to be more under control than those of the chest, and hence it is, perhaps, that the wind is so carefully scrutinized by all purchasers of horses. There is, also, much greater difficulty in ascertaining the condition of the lungs and their appendages, and the ordinary observer can only judge of them by an absolute trial; while the state of the legs may be seen and felt, and that of the feet can be tolerably well ascertained by a very short run upon hard ground. So, also, with the acute diseases of these parts; while the legs and feet manifest the

slightest inflammation going on in them by swelling and heat, the air-passages may be undergoing slow but sure destruction, without giving out any sign that can be detected by any one but the practised veterinarian. In most of the diseases of the chest there is disturbance of the breathing, even during a state of rest; but in some of them, as in roaring, for instance, no such evidence is afforded, and the disease can only be detected by an examination during, or immediately after, a severe gallop.

CATARRH, OR COLD.

CATARRH may be considered under two points of view; either as an inflammation of the mucous membrane of the nasal cavities, accompanied by slight general fever; or as an ephemeral fever of three or four days duration, complicated with this condition of the nose. The latter is, perhaps, the more scientific definition, but for common purposes it is more convenient to consider it as mainly consisting in the most prominent symptom. There is invariably some degree of feverishness, sometimes very considerable, at others so slight as to be easily passed over. Usually the pulse is accelerated to about forty or fifty, the appetite is impaired, and there is often sore throat, with more or less cough. On examining the interior of the nostrils, they are more red than natural, at first dry and swollen, then bedewed with a watery discharge which soon becomes yellow, thick, and, in bad cases, purulent. The eyes are generally involved, their conjunctival coat being injected with blood, and often some slight weeping takes place, but there is always an expression of sleepiness or dulness, partly owing to the local condition of the organ, and partly to the general impairment of the health. The disease is caused in most instances by a chill, either in the stable or out, but sometimes, even in the mildest form, it appears to be epidemic. *The treatment* will greatly depend upon the severity of the seizure; usually, a bran-mash containing from six drachms to one ounce of powdered nitre in it, at night, for two or three consecutive periods, will suffice, together with the abstraction of corn, and, if the bowels are confined, a mild dose of physic should be given. In more severe cases, when there is cough and considerable feverishness, a ball composed of the following ingredients may be given every night:—

Take of Nitrate of Potass	2 drachms.
Tartarized Antimony	1 drachm.
Powdered Digitalis	$\frac{1}{2}$ drachm.
Camphor	$1\frac{1}{2}$ drachm.
Linsced meal and boiling water enough to make into a ball.	

If the throat is sore, an embrocation of equal parts of oil, turpentine, tincture of cantharides, and hartshorn, may be rubbed in night and morning.

Should the disease extend to the bronchial tubes, or substance of the lungs, the treatment for bronchitis or pneumonia must be adopted.

The stable should be kept cool, taking care to make up for the difference in temperature by putting on an extra rug; water should be allowed *ad libitum*, and no corn should be given.

Sometimes the discharge becomes chronic, and it is then known by the name *ozena*.

INFLUENZA, OR DISTEMPER.

THIS MAY BE CONSIDERED TO BE an epidemic catarrh, but the symptoms are generally more severe and leave greater prostration of strength behind them. They also require more careful treatment, which must be specially adapted to the attack, for remedies which will arrest the disease in one year will totally fail the next time that the epidemic prevails. The fever of late years has had a tendency to put on the typhoid type, and bleeding, which formerly was often beneficial, is now completely forbidden. The *symptoms* are at first similar to those already described as pertaining to common catarrh, but after a few days the accompanying fever is more severe than usual, and does not abate at the customary period. The appetite is altogether lost, and the appearance of the patient is characteristic of severe disease rather than of a trifling cold. It is, however, chiefly from the fact that a number of horses are seized with similar symptoms, either at the same time or rapidly following one another, that the disease is recognised. It usually prevails in the spring of the year, or in a wet and unhealthy autumn. Sometimes almost every case runs on to pneumonia, at others the bronchial mucous membrane alone is attacked; but in all there is extreme debility in proportion to the apparent nature of the disease. The ordinary appearances exhibited in recent epidemics have been as follows:—The first thing observed is a general slight shivering, accompanied by a staring coat. The pulse is weak, and slightly accelerated, but not to any great extent; the mouth feels hot; the eyes and the nostrils are red; the belly is tucked up; there is no appetite; cough, to a varying extent, begins to show itself; and there is generally a heaving of the flanks. The legs and feet are not cold as in pneumonia, but beyond this they afford no positive signs. The cellular membrane around the eyes, and of the legs, generally swells about the second day, and often the head and limbs become quite shapeless from this cause. In the early stage the bowels are often relaxed, but afterwards they are as frequently confined. Sore throat is a very common complication, but it is not by any means an invariable attendant on influenza. It is, however,

somewhat difficult to ascertain its existence, as in any case there is no appetite for food. *The treatment* should be conducted on the principle of husbanding the strength, and, unless urgent symptoms of inflammation show themselves, the less that is done the better. If the trachea or larynx is involved only slightly, counter irritation, by means of a liquid blister, must be tried, without resorting to strong internal medicines; but if serious mischief ensues, the case must, to a certain extent, be treated as it would be when coming on without the complication of influenza, always taking care to avoid bleeding, and merely acting on the bowels by gentle aperients, and on the skin and kidneys by the mildest diaphoretic and diuretic. The following is the ordinary plan of treatment adopted:

Take of Spirit of Nitric Ether	1 ounce.
Laudanum	4 drachms.
Nitrate of Potass	3 drachms.
Water	1 pint.

Mix, and give as a drench night and morning.

By constantly offering to the horse thin gruel (taking care that it does not become sour), and no plain water, sufficient nourishment may be given, as his thirst will induce him to drink.

During the stage of convalescence the greatest care must be taken. At first, as soon as the cough has somewhat subsided, a mild stomachic ball will be desirable, such as

Take of Extract of Gentian	6 drachms.
Powdered Ginger	2 drachms. Mix.

Afterwards, if the case goes on favorably, and the appetite returns, the restoration may be left to nature, giving the horse by degrees his usual allowance of corn, and adding to his morning and evening feed one drachm of sulphate of iron in fine powder. It must not be attempted to give this until the appetite is pretty keen, or the horse will be disgusted, and will probably refuse his corn altogether.

Should typhoid symptoms be clearly established, the case must be treated according to the directions hereafter laid down for typhus fever.

BRONCHITIS.

BRONCHITIS is an inflammation of the mucous membrane lining the bronchi, and almost invariably extending to these parts through the trachea, from the larynx and nasal passages, which are primarily affected as in ordinary cold. The membrane in the early stage becomes filled with blood, and as a consequence the diameter of the tubes is diminished, attended by some difficulty and increased rapidity of breathing. After a time a frothy mucus is poured out from it, and this still further interferes with respiration, and necessitates a constant cough to get rid of it. *These symptoms* are always present, but they will vary greatly in inten-

sity, and in the rapidity with which they progress, from which circumstances bronchitis is said to be *acute or chronic*, as the case may be. *In the acute form* there are also several variations, and veterinary writers are in the habit of again subdividing it into acute and sub-acute, but the two leading divisions are sufficient for all practical purposes. It begins with the usual premonitory appearances of a severe cold, accompanied by a staring coat, and entire loss of appetite. The breathing is somewhat quicker than natural, and the pulse is raised to sixty or seventy. The legs remain of the usual temperature, and there is a hard dry cough, the lining membrane of the nostrils being intensely red, and in severe cases dry and swollen. On auscultation there is a dry rattling sound, very different from the crepitation of pneumonia, and as soon as mucus is secreted, succeeded by gurgling, and soap-bubble sounds, easily distinguished when once heard. If the attack goes on favorably, the cough becomes loose, and there is a free discharge of mucus, both from the lungs, as evidenced from the nature of the cough, and from the nostrils, as shown by the running from them. On the other hand, the prognosis is unfavorable when the breathing is very laborious, with the legs extended, and the cough constant and ineffectual in affording relief. Should no relief be afforded, death takes place a week or ten days after the onset of the disease, from suffocation. *The treatment* should depend greatly upon the urgency of the inflammation, which only an experienced eye can judge of. If slight, nitre and tartar emetic internally, and a blister (to one or both sides, according to the extent of bronchi involved), will suffice, but in very severe cases blood must be taken at the onset, or it will be impossible to control the inflammation. Bleeding should be avoided if it is judged prudent to do so, for of late years the type of diseases has changed so much in the horse, that he is found to bear loss of blood badly. Nevertheless, it is not wise to lay down the rule that it is never desirable. The bowels must be acted on by the ordinary physic ball, resorting to raking and clysters, if the time cannot be afforded for the usual laxative preparation. For the special control of the morbid state of the membrane the following ball will be found advantageous:—

Take of Digitalis	$\frac{1}{2}$ drachm.
Calomel	$\frac{1}{2}$ drachm.
Tartar Emetic	60 to 80 grains.
Nitre	2 drachms.

Mix with treacle, and give twice a day.

Should the disease continue after the blister is healed, a large seton may be put in one or both sides with advantage.

CHRONIC BRONCHITIS seldom exists except as a sequel to the acute form, and after adopting the balls recommended for that

state, it may be treated by attention to the general health, a seton in the side, and the exhibition of an expectorant ball twice a day, composed of the following materials:—

Take of Gum Ammoniacum	$\frac{1}{2}$ ounce.
Powdered Squill	1 drachm.
Castile Soap	2 drachms.
Mix and make into a ball.	

CHRONIC COUGH.

BY THIS TERM is understood a cough that comes on without any fever or evidences of the horse having taken cold. It differs in this respect from chronic bronchitis, which generally supervenes upon the acute form, and is always attended in the early stage by feverishness. It appears probable that chronic cough is dependent upon an unnatural stimulus to the mucous membrane, for it almost always makes its appearance when much corn is given without due preparation, and ceases on a return to green food. It is, therefore, very commonly termed a stomach cough. The *symptoms* are all summed up in the presence of a dry cough, which is seldom manifested while in the stable, but comes on whenever the breathing is hastened by any pace beyond a walk. Two or three coughs are then given, and the horse perhaps is able to go on with his work, but after resting for a few minutes, and again starting, it comes on again, and annoys the rider or driver by its tantalizing promise of disappearance followed by disappointment. Very often this kind of cough is caused by the irritation of worms, but any kind of disorder of the digestive organs appears to have the power of producing it. The *usual treatment* for chronic bronchitis seems here to be quite powerless, and the only plan of proceeding likely to be attended with success, is to look for the cause of the irritation, and remove it. Sometimes this will be found in a hot stable, the horse having previously been accustomed to a cool one. Here the alteration of the temperature by ten or fifteen degrees will in a few days effect a cure, and nothing else is required. Again, it may be that the corn has been overdone, in which case a gentle dose of physic, followed by a diminished allowance of corn, and a bran-mash twice a week, will be successful. If the stomach is much disordered, green food will be the best stimulus to a healthy condition, or in its absence a few warm cordial balls may be tried. The existence of worms should be ascertained in doubtful cases, and if they are present, the proper remedies must be given for their removal. Linseed oil and spirit of turpentine, which are both excellent worm remedies, are highly recommended in chronic cough, and whether or not their good effect is due to their antagonism to worms, they may be regarded as specially useful.

A very successful combination is the following mixture:—

Take of Spirit of Turpentine	2 ounces.
Mucilage of Acacia	6 ounces.
Gum Ammoniacum	$\frac{1}{2}$ ounce.
Laudanum	4 ounces.
Water	2 quarts.

Mix, and give half-a-pint as a drench every night: the bottle **must** be well shaken before pouring out the dose.

LARYNGITIS, ROARING, WHISTLING, &c.

ONE OF THE MOST COMMON diseases among well-bred horses of the present day, is the existence of some mechanical impediment to the passage of the air into the lungs, causing the animal to "make a noise." The exact nature of the sound has little or no practical bearing on the cause that produces it; that is to say, it cannot be predicated that roaring is produced by laryngitis; nor that whistling is the result of a palsy of some particular muscle, but undoubtedly it may safely be asserted that all lesions of the larynx, by which the shape and area of its opening (*rima glottidis*) are altered and diminished, are sure to have a prejudicial effect upon the wind, and either to produce roaring, whistling, wheezing, or trumpeting, but which would result it might be difficult to say, although the precise condition of the larynx were known, which it cannot be during life. Until recently veterinary surgeons were puzzled by often finding on examination of a roarer's larynx after death no visible organic change in the opening, and many were led to imagine that this part could not be the seat of the disease. On a careful dissection, however, it is found that a muscle or muscles whose office it is to dilate the larynx is wasted and flabby (*crico-arytenoideus lateralis* and *thyro-arytenoideus*). The other muscles are perhaps equally atrophied, but as their office is to close the opening, their defects are not equally injurious, and at all events are not shown by producing an unnatural noise. The cause of this wasting is to be looked for in pressure upon the nerve which supplies these muscles, and which passes through an opening in the posterior ala of the thyroid cartilage, so that whatever causes a displacement of that part will mechanically affect the nerve. For these several reasons it will be necessary to examine first of all into the several kinds of inflammation, &c., to which the larynx is subject, and then to investigate as far as we may, the nature, mode of detection, and treatment of the several conditions known to horsemen by the names of roaring, whistling, &c., which are only symptoms of one or other of the diseases to which allusion will presently be made.

BY ACUTE LARYNGITIS is meant a more than ordinary inflammation of the larynx, and not that slightly morbid condition in which the mucous membrane of that organ is always involved in "the passage of a cold into the chest." In the latter state the ear

detects no unusual sound, and indeed there is plenty of room for the air to pass. But in true laryngitis, on placing the ear near the throat, a harsh rasping sound is heard, which is sufficient at once to show the nature and urgency of the symptoms. The mucous membrane is swollen, and tinged with blood; the rima glottidis is almost closed, and the air in passing through it produces the sound above described, which, however, is sometimes replaced by a stridulous or hissing one. In conjunction with this well-marked symptom there is always a hoarse cough of a peculiar character, and some considerable fever, with frequent respiration, and a hard, wiry pulse of seventy to eighty. The *treatment* must be of the most active kind for not only is life threatened, but even if a fatal result does not take place, there is great danger of permanent organic mischief to the delicate apparatus of the larynx, generally from the effusion of lymph into the submucous cellular membrane. A full bleeding should at once be practised, and repeated at the end of twelve hours if there is no relief afforded and the pulse still continues hard. The hair should be cut off the throat, and the tincture of cantharides brushed on in a pure state until a blister arises, when the part may be constantly well fomented, to encourage the discharge. Large doses of tartar emetic, calomel, and digitalis, must also be given, but their amount and frequency should be left to an experienced veterinarian, the preliminary bleeding and blistering being done in his absence to save time. It is a case in which medicine must be pushed as far as can be done with safety, and this cannot well be left to any one who is not well acquainted with its effects, and with the powers of the animal economy. Gruel is the only food allowed during the acute stage, and there is seldom time to have recourse to aperient physic until the urgent symptoms are abated, when an ordinary dose may be given. During convalescence the greatest care must be taken to prevent a relapse, by avoiding all excitement either by stimulating food or fast exercise.

CHRONIC LARYNGITIS may occur as the result of the acute form above described, or it may come on gradually, without any violent inflammation preceding it. In either case *the symptoms* are similar in their nature to those met with in the acute form, but less in degree. The noise made is not nearly so harsh, and can often hardly be heard on the most careful examination. The peculiar harsh, grating cough is, however, always present, and by it the nature of the case may generally be easily made out. The disease often accompanies strangles, although in nine cases out of ten it is overlooked by the careless attendant. Very commonly, however, it makes its ravages in so insidious a manner that no suspicion is felt of its presence, until the horse begins to make a noise, though he must in all probability have shown by the cough peculiar

to the complaint, that it has been working its way for some weeks at least. Such cases chiefly occur in the training stable, and are due, according to my belief, to the enormous quantity of oats which it is now the fashion to give to colts from the earliest period of their lives, increased to seven and eight feeds a day during the second year. Continued spirit-drinking has precisely the same effect upon the human being, and the harsh stridulous cough of the confirmed drunkard marks the existence of ulceration of the larynx, in the only way which he will allow it to be displayed, for he is not, like the horse, made to exert his powers of running, whether his wind is good or bad. There is, of course, a considerable difference between the two diseases, but there is sufficient analogy between them to explain why the stimulus of over-coming should affect the larynx in preference to any other part. It would be difficult to show the connection between the two in any other way, beyond the simple fact that roaring has become general in an exact proportion to the prevalence of the present fashion of feeding. The advocates of the plan will say that though the two have come in together, yet it is merely a coincidence, and not a consequence the one of the other; but if it can be shown that in man a similar cause produces a similar effect, the argument is strengthened to such a degree as to be almost unanswerable. But whatever may be the cause there can be no doubt that the *treatment* is most troublesome, and often baffles the skill of the most accomplished veterinarian. Blistering is not so useful as counter-irritation by a seton, which must be inserted in the loose skin beneath the jaw, as close as possible to the larynx. This alone will do much towards the cure, but no pains must be spared to assist its action by a cooling regimen, consisting of bran mash, and if in the spring or summer, green food, or in the winter, carrots. Corn must be entirely forbidden, and the kidneys should be encouraged to act freely by two or three drachms of nitre given in the mash twice a day. When the case is very intractable, the nitrate of silver may be applied to the part itself by means of a sponge fastened to a piece of flexible cane or whalebone. The mouth should then be kept open with the ordinary balling iron, and the sponge rapidly passed to the situation of the top of the larynx, and held there for a second, and then withdrawn. I have succeeded in curing two obstinate cases of chronic laryngitis by this plan, but some little risk is incurred, as in one of them imminent symptoms of suffocation presented themselves, but soon went off. I should not, therefore, recommend the application excepting in cases where all other means have failed, and in which there is reason to believe that the patient is likely to become a permanent roarer or whistler. The nitrate of silver has great power in producing resolution of inflammation in mucous surfaces, and in this disease little or

nothing can be effected by general measures. The solution should be from ten to fifteen grains in the ounce of distilled water.

ROARING is the bugbear of the purchaser at the hammer, and not without good reason. The most experienced veterinarian or dealer will often fail to ascertain its existence, in spite of all the artifices he may call into play. Not the slightest sound is heard during a state of quiescence, or even when the horse is trotted or galloped for the short distance which "the ride" will afford. The blow on the side given with due artistic effect elicits no grunt, and yet the animal is a confirmed roarer, and not worth a shilling perhaps for the purpose to which he is intended to be devoted. On the other hand, many a sound horse is condemned as a roarer for giving out the obnoxious grunt; and though there is no doubt that this sign may be relied on in a great many cases, yet it cannot be accepted as either negatively or positively a certain proof. The only real trial is the noiseless gallop on turf or plough, when the ear can detect the slightest sound, and can distinguish its exact nature, and the precise spot from which it proceeds. Many a horse will, when he is excited, make a harsh noise in his breathing, accompanied by a kind of "gluck," proceeding from a spasmodic flapping of the velum palati; but on galloping him all this goes off, and he may probably exhibit excellent wind. Such cases I have many times known, and they would be condemned as unsound by those who have had little experience, or are content with a careless and inefficient trial. Stallions are particularly prone to make this kind of noise, and it is extremely difficult to ascertain their soundness in this respect by any means which can be safely resorted to. The causes of roaring are of three kinds: 1st, Inflammation, which has left a thickening or ulceration of the mucous membrane, or a fungous growth from it; 2d, Paralysis of the muscles; and 3d, An alteration of the shape of the cartilages of the larynx, produced by tight reining.

In roaring produced by an ulcerated or thickened condition of the mucous membrane, or by a fungous growth, the sound elicited is always the same in proportion to the rapidity of respiration. None of the ordinary expedients by which the breath is introduced in a modified stream (such as a full meal, or pressure on the nostrils or windpipe), will be of much avail, and the horse roars sturdily whenever his pace is sufficiently accelerated. If a horse so affected can be made to grunt by the blow on the side, the sound will always indicate the disease, for it will be harsh and rough, and not the natural grunt of the animal. It is usually supposed that no treatment can be of the slightest avail here; but I believe that sometimes the continued application of nitrate of silver, as recommended at page 334, would be followed by a certain amount of amelioration, the extent of which it is impossible

to guess at without a trial. In any case, when the animal is rendered almost worthless by disease, it is fair to try experiments which are neither expensive nor cruel; and from the effect of the remedy in those cases in which it has been used, I am led to expect that it may prove beneficial in those of longer standing. Setons, blisters, and embrocations are all useless, as has been proved in numberless cases; and beyond the palliation which can be afforded by employing the horse only at such a pace as his state will allow, nothing else can be suggested. In some cases the roarer will be able to do ordinary harness work, which, however, in hot weather, will try him severely; in others he may be so slightly affected as to be fit to hunt in a country where, from its nature, the pace is not very severe; but by confirmed roarers the slow work of the cart is all that can be performed without cruelty.

Where *paralysis of the muscles* that open the rima glottidis is the seat of the roaring, no plan has yet been suggested which is of the slightest avail. In the first place, it is extremely difficult, and indeed almost impossible, to diagnose the affection, and I know of no means by which paralysis can be ascertained to exist during life. Hence, although it is barely possible that by the use of strychnine the nerve might be stimulated into a restoration of its functions, yet as the case cannot be ascertained, it is scarcely wise to give this powerful drug in the hope that it may by chance hit the right nail on the head. This paralytic condition seems chiefly to attack carriage horses, and probably arises from the pressure made by the over-curved larynx upon the laryngeal nerve as it passes through the opening in the thyroid cartilage. Many veterinary writers have looked to the recurrent branch of the par vagum to explain the loss of power, but I believe it is rather to the laryngeal nerve that the mischief is due. It must be remembered that carriage-horses are not only reined up for hours while doing their daily work out of doors, but they are also often placed in the same position, or even a more constrained one, by the coachman in the stable, in order to improve their necks. One horse of his pair perhaps has naturally a head better set on than the other, and he wishes to make nature bend to his wishes by compelling the other to do that which the shape of his jaw forbids without a sacrifice. The mouthing tackle is put on in the stable with this view, and the poor horse is "kept on the bit" for three or four hours early in the morning, during which time his larynx is pressed between his narrow jaws into a most unnatural shape. The consequence is either that the nerve is pressed upon, and the muscles to which it is supplied are paralyzed, as in the condition which we are now considering, or the cartilages are permanently disfigured, which is the subject of the next paragraph. When the paralysis

is established, I believe no means but the internal use of strychnine are at all likely to be beneficial.

An alteration in the shape of the cartilages, so as to permanently change their form, is, I believe, the least common of all the causes of roaring. Pressure for a very long time will be required to effect this, and far more than suffices to paralyze the nerve. Cases, however, are recorded, and the parts have been preserved, so that there can be no doubt of their occasional occurrence. No *treatment* can be of the slightest service.

Although roaring, in all its varieties, may be said to be generally incurable, yet it may be greatly palliated by general attention to the state of the lungs and stomach, by proper food, and by the use, while the horse is at work, of a special contrivance, of a most ingenious nature, published by Mr. Reeve, of Camberwell, in the *Veterinarian* for 1858, but said to have been in use for many years among the London omnibus and cab men. At all events, Mr. Reeve deserves the credit of having laid the matter before the profession, and of explaining the true principle upon which it acts. He says, in his paper on the subject: "I thought it possible to so modify the atmospheric supply to the lungs, that, during exercise, the volume of air, when it arrived at the glottis, should not exceed that which passed through its opening when the horse was tranquil, and which (from the fact of the sound being absent) does not at that time produce roaring. A strap was accordingly made to pass around the nose of the horse, just over the region of the false nostrils, and buckle beneath the lower jaw. To the inner surface of this strap, and immediately over the false nostril on each side, was fixed a body resembling in shape the half of a hen's egg, cut longitudinally. When applied, these bodies pressed upon the triangular spaces formed by the apex of the nasal bones and upper jaw, thus closing the false nostrils, and partly diminishing the channel of the true ones. The result was highly gratifying; for the patient, which previously could not travel without stopping every minute to take breath, now travelled, to all appearance, without inconvenience or noise. At first, the strap seemed slightly to annoy the horse; and whenever it became displaced, the roaring would again commence. A slight modification, however, overcame every difficulty: the strap, instead of being buckled around and under the jaw, was fastened on each side of the bit; and, to prevent its descent, another was carried from its centre, and fastened to the front of the harness-bridle." Mr. Reeve asserts that the effect was all he could have wished, and that the horse on which he tried the plan, "which previously had been entirely useless, now performs his work in a heavy brougham, and gives great satisfaction. The roaring is stopped, and, with the usual speed, there appears no impediment to respiration"

He concludes: "I have paid particular attention to this case, and am inclined to think, that when by the compression we have neutralized the action of the false nostrils, the object is effected without the necessity of further narrowing the nasal passage."

Few people would care to drive a roarer, if they could help it, even with the aid of the nasal compress; but if necessity compels such a proceeding, it is well to know how the poor animal may be used with least annoyance to himself and his master.

HIGHBLOWING is a perfectly healthy and natural habit, and cannot be confounded with roaring by any experienced horseman. It is solely confined to the nostrils; and the noise is not produced in the slightest degree during inspiration, but solely during the expulsion of the air, which is more forcible and rapid than usual, and accompanied by a vibratory movement of the nostrils, which is the seat of the noise. Roaring, on the contrary, continues during inspiration, as well as expiration; and by this simple test the two may readily be distinguished. Most highblowers have particularly good wind, of which the celebrated Eclipse is an example; for there is no doubt that he was addicted to the habit.

WHISTLING (AND PIPING, which is very similar to it), are produced by the same causes as roaring, in an exaggerated condition. Thus, a roarer often becomes a whistler as the rima glottidis is more and more closed by disease; on the other hand, the whistler is never converted into a roarer. The noise made is seldom a decidedly shrill whistle, but it has more resemblance to that sound than to roaring, and the name may well be retained as descriptive of it. Whistlers are always in such a state of confirmed disease, that treatment is out of the question—indeed, they can only be put to the very slowest kind of work.

WHEEZING is indicative of a contracted condition of the bronchial tubes, which is sometimes of a spasmodic nature, and at others is only brought on during occasional attacks after exposure to cold. The *treatment* should be that recommended for chronic bronchitis, which is the nature of the disease producing these symptoms.

TRUMPETING is not very well defined by veterinary writers, and I confess that I have never heard any horse make a noise which could be compared to the trumpet, or to the note of the elephant so called.

THE QUESTION RELATING TO THE HEREDITARY NATURE of roaring is one which demands the most careful examination before a reliable answer can be given to it. It would be necessary to select at random a number of roaring sires and dams, and compare their stock with that of an equal proportion of sound animals, which would be a Herculean task, beyond the power of any private individual. Nothing short of this could possibly settle the dispute;

but, as far as opinion goes, it may be assumed that there are strong authorities against the hereditary nature of the diseases which produce roaring. That it is often the result of ordinary inflammation, which in itself can scarcely be considered hereditary, is plain enough; and that it is also produced by mismanagement in tight reining is also admitted, which latter kind can scarcely be supposed to be handed down from sire to son; but that it is safer, when practicable, to avoid parents with any disease whatever, is patent to all

PNEUMONIA AND CONGESTION OF THE LUNGS.

THE THEORETICAL DEFINITION OF PNEUMONIA is that it consists of inflammation of the parenchyma of the lungs, independently both of the mucous lining to the air passages, and of the serous covering of the whole mass. The mucous membrane ceases abruptly at the terminations of the bronchial subdivisions, and consequently the air-cells are not lined with a continuation from it. Hence there is an extensive cellulo-fibrous area, which may be the subject of inflammation, without implicating the mucous surface. Until within the last fifteen or twenty years, it was commonly supposed that the air-cells were all lined by mucous membrane, and that the parenchyma was confined to an almost infinitesimally thin structure, filling up its interstices; but the microscope has revealed the true structure of the lungs, and has shown that there is a well-founded distinction between bronchitis and pneumonia, upon the ground of anatomy, as well as observation. Still, it cannot be denied that the one seldom exists to any great extent, or for any long period, without involving the adjacent tissue; and oroncho-pneumonia, as well as pleuro-pneumonia, are as common as the pure disease.

PNEUMONIA, OR PERIPNEUMONY, must be examined, with a view, first, to its intensity, whether *acute* or *sub-acute*; and secondly, as to its effects, which may be of little consequence, or they may be so serious as to completely destroy the subsequent usefulness of the patient. It is not, therefore, alone necessary to provide against death by the treatment adopted, but due care must also be taken that the tissue of the lungs is not disorganized by a deposition of lymph, or of matter, so as to lead, in the one case, to a consolidation of the air-cells, and, in the other, to the formation

of a large abscess, and consequent destruction of substance. The former is a very common sequel of pneumonia; and probably there are few attacks of it without being followed by a greater or less degree of hepatization, by which term the deposit of lymph is known, from its causing the lungs to assume the texture of liver (*ἡπαρ*). In very severe cases, gangrene of the lungs is induced; but as death almost always speedily follows this condition, it is not necessary to consider it, excepting as bearing upon the fatal result.

The *cause* of pneumonia may be over-exertion, as in the hunting-field, especially in an unprepared horse; or it may come on as a primary disease after exposure to cold; or it may follow upon bronchitis when neglected and allowed to run on without check. In the two first cases it appears to be produced by the great congestion of blood which takes place in the fine network of vessels of which the lungs are in great part composed. The blood in the one case is collected by the increased necessity for its aeration with a failing circulation, as in over-exhaustion, or in the other it is forced inwards upon the vital organs by the chill which the skin has received. The capillaries are then roused to act beyond their strength, and an inflammatory condition is established as a reparatory effort of nature, which may possibly stop short as soon as the object is accomplished, but more frequently goes on beyond this, and an attack of pneumonia sets in with more or less intensity, according to circumstances. For these reasons, when the lungs are evidently congested, no pains should be spared to relieve them by causing the skin to act, before the aid of nature is invoked, since it can never be certain that she will stop short at the proper point.

CONGESTION OF THE LUNGS is too often neglected and allowed to go on to inflammation. Veterinary surgeons, indeed, are seldom called in before this stage has run its course and inflammation is established. It is true that every hunting man endeavors to ascertain all the particulars relating to it, because he is constantly in fear of having to treat it, and he would gladly benefit by the advice and experience of those more competent to treat it than himself. But the great mass of horsemasters are wholly ignorant of its action, and I shall therefore endeavor to lay down instructions which may be beneficial to those who are so unlucky as to have a horse with congested lungs, either caused by over-exertion or by a chill, or by a combination of the two, as most frequently happens.

When a fat "*dealer's horse*," that is, one made up for sale and not for use, is ridden in a sharp burst across country, his lungs are most unfortunately tried, for he is not only loaded with blood containing an excess of stimulating materials (or in a state of plethora, as it is called), but his heart and blood-vessels are not prepared by

previous exercise to carry on the circulation when unusual demands upon them are made. The consequence is that, as soon as he has gone half a dozen miles, he not only tires, but, if pressed, his gallant spirit carries him on until the blood collects and stagnates in his lungs, from a defect in the circulating apparatus, and he becomes absolutely choked from a want of that decarbonization which is necessary to his very existence. Air is taken freely into his lungs, but the circulation almost ceases in them, and in spite of his hurried breathing, as shown by his panting sides, he is almost as completely suffocated as if a cord was tied round his neck. On examining his eyes and nostrils they are seen to be turgid and *purple*, the vessels being filled with carbonized blood, while the heart beats rapidly but feebly, and the countenance is expressive of anxiety and distress. In this state many a horseman finds his steed every winter, and a pretty dilemma he is in. The question of *treatment* is a serious one, even to the most experienced in such matters, but one thing is quite clear, that the more urgent the case the more danger there is in having recourse to the lancet. Bleeding to the extent of a few pounds will sometimes relieve a trifling case of exhaustion, but in a really severe one it will take away the only chance which remains. The best plan is to give the animal plenty of air, turn his head to the wind, and if any kind of fermented liquor can be obtained, give him a little at once. Neat spirits are apt to cause increased distress from spasm of the larynx, but it is even better to risk this than to let the exhaustion continue. If, therefore, the horse is incapable of walking to the nearest farm-house or inn, the better plan is to leave him with a light covering on him of some kind, and at once proceed to procure a quart of ale or wine, or spirits and water, whichever can be obtained the most easily. One or other of these, slightly warmed and spiced, if possible, should be poured down his throat, which can readily be done, as he has no power to resist, and then in a few minutes he may generally be induced to move quietly on towards the nearest stable. Here he must remain all night if the attack is a bad one, or if he recovers soon he may be walked quietly home. When he reaches his stable he may be treated according to the directions given at page 188, and in the evening or the next morning early, if the pulse rises and is hard and jerking, he may be bled with advantage, but rarely should this be done for some hours after the first attack. Congestion is essentially produced by debility, and although an abstraction of blood relieves the vessels of a part of their load, it increases their weakness in a still greater degree, and they are less able to do their work, diminished though it may be, than they were before. Hundreds of over-worked horses have been killed by the abuse of the lancet

in the hunting-field, but the principle on which their treatment should be conducted is better understood now than formerly.

WHEN CONGESTION shows itself as the result of a chill, the following *symptoms* are displayed:—First and foremost there is rapid and laborious breathing, the horse standing with his legs wide apart, his head thrust straight forward, and his flanks heaving. The skin is generally dry, but if there is any sweat it is a cold one. The legs are icy cold, and also the ears. The whites of the eyes and lining of the nostrils are of a purplish hue, but not very deep in colour. The pulse is slightly accelerated (from forty to fifty), but not hard and incompressible; and lastly, the attack is of recent duration. These signs, however, are not to be fully relied on as marking congestion rather than inflammation, without having recourse to an examination of the lungs by means of the ear. Placing it against the side of the chest, in inflammation there would be certain marked sounds, presently to be described, whilst in the state we are now considering they are wholly absent, and all that is heard is the usual respiratory murmur slightly increased in intensity. It is of the utmost importance to make out exactly the nature of the case, for the *treatment* should be very different in congestion and inflammation. If in the former condition the blood can only be drawn into the skin, relief is at once afforded and all danger is at an end; but in the latter, though some slight advantage would be gained, the progress of the disease would not be materially checked. To produce this determination of blood to the skin without loss of time, is sometimes very difficult; but by the application of hot water and blankets it may generally be accomplished. Two men, supplied with a tub of very hot water and plenty of clothing, should be rapid in their movements, and proceed as follows:—Have an assistant ready to strip the patient when ordered, then, dipping a blanket in the water, it is taken out and partially wrung, leaving as much water in its meshes as it can hold without dropping; as soon as it is cool enough for the human hand to bear its pressure it should be gently, but quickly, laid upon the horse's back, and the rug, which has just come off, while still warm, placed over it, with two or three more over all, the number depending upon the temperature of the air. Another smaller rug may in the same way be wetted and applied to the neck, covering it with two or three hoods, but taking care to avoid pressure upon the windpipe. The legs also should be wrapped in flannel bandages, made as hot as possible before the fire, but dry. In the course of half an hour, if the skin of the parts uncovered does not become warm, and show evidences of sweating coming on, another rug must be dipped in the same way, and substituted quickly for the first

Usually, however, the desired effect is produced within twenty minutes, and then great care and some little tact are required to manage the operation. If the sweating is allowed to go on beyond a certain point exhaustion is produced, attended by almost as much danger as inflammation; while on the other hand, in attempting to moderate the action of the skin, risk is incurred of a chill, and thus upsetting all the benefit which might otherwise have been derived. But by throwing open the doors to the external air, which may freely be admitted as soon as the skin acts, and by reducing the number of additional rugs, the amount of sweat given off may be kept within due bounds, and in the course of two or three hours the previously wetted rug or blanket may be removed, and a dry, warm one substituted for it, but the assistants must be quick and handy in effecting the change. Many a case of inflammation of the lungs, kidneys, or bowels might be stopped *in limine* by the adoption of this plan; but the misfortune is that it requires all the skill and tact of the veterinary surgeon, first of all to diagnose the case, and afterwards to manage its treatment. Still, if a master will undertake the superintendence of the operation himself, and is accustomed to disease, there is little risk of failure.

THE SYMPTOMS OF ACUTE PNEUMONIA are a quick and distressed respiration, averaging about sixty inspirations in the minute. Pulse quick (from seventy to eighty-five); hard, often small, but always compressible. Nostrils distended, and the lining membrane red (except in the last stage, when suffocation is imminent). Cough short, and evidently giving pain, which occasions it to be checked as much as possible. Legs and ears generally cold, often icy. Feet wide apart; evidently with an instinctive desire to dilate the chest as much as possible. On putting the ear to the chest, if the attack is very recent, there will be merely a greatly increased respiratory murmur; but when fully developed there may be heard a crepitant rattling, which is compared to the crackling of a dried bladder; but I confess that I could never make out the similarity between the two sounds. In the later stages, this is succeeded by an absence of all sound, owing to the consolidation of the lungs, or by mucous rattles depending upon the secretion of mucus. On tapping the exterior of the chest with the ends of the fingers (percussion), the sound given out is dull in proportion to the extent of mischief, the effect of pneumonia being to convert the spongy texture of the lungs into a solid substance like liver. The *treatment* will greatly depend upon the stage of the disease, the age and constitution of the horse, and the nature of the prevailing epidemic, if there is one. In modern days bleeding is very badly borne, either by

man or horse, nevertheless few cases of genuine pneumonia will be saved without it. Sufficient blood must be taken to make a decided impression on the circulation, without which the inflammation will not be mastered. The quantity necessary for this cannot be fixed, because the effect will vary so materially, that the abstraction of three or four quarts of blood in one case will do more than double or treble that quantity in another. A large orifice must be made in the vein, and it must not be closed until the lining membrane of the nose or the white of the eye is seen to have become considerably paler. It may possibly even then be necessary to repeat the operation six hours afterwards, or next day, according to the symptoms. The rule should be followed of taking enough but not a drop too much, for blood removed from the circulation takes a long time to replace. With regard to medicine, tartar emetic is the only drug which seems to have much influence over pneumonia, and it must be given every six hours in drachm doses, with from half a drachm to a drachm of powdered digitalis, or white hellebore, to keep down the pulse, and two or three drachms of nitre, to increase the action of the kidneys. Unless the bowels are confined no aperient should be given, and if necessary only the mildest dose should be used. The diet should consist of bran mash, gruel, and a little hay, or green food if the season of the year allows. A cool airy stable and warm clothing are indispensable in this disease. When the first violence of the attack has subsided, a large blister on the side of the chest will afford great relief, and when it ceases to act, if the disease is not entirely cured a second may be put on the other side.

SUB-ACUTE PNEUMONIA differs in no respect from the acute form, excepting in degree, and the symptoms and treatment will vary only in proportion.

THE TERMINATIONS of pneumonia may be death, or resolution (by which is to be understood a disappearance of the symptoms without leaving any mischief behind), or hepatization, or abscess. The last-named sequel may be very serious in extent, but if an opening is made by nature for the discharge of its contents into the bronchial tubes the horse may recover, and his wind may be sufficiently good for any purposes but the racecourse or the hunting field. Hepatization is always attended with thick wind, but in other respects the health may be good, and the horse may be suited to ordinary work. In process of time some of the lymph is absorbed, and a considerable improvement takes place, but it never entirely disappears, and a horse which has once suffered from pneumonia attended by hepatization remains permanently unsound.

PLEURISY.

THIS DISEASE is characterized by a very peculiar respiration, the expirations being much longer than the inspirations, owing to the pain which is given by the action of the muscles necessary for the latter, while the former, if the chest is allowed quietly to fall, is almost painless. Nevertheless, the breathing is quicker on the whole than natural, being from forty to fifty per minute. The pulse is quick, small, and incompressible. Nostrils and eyes of a natural color, and the former are not dilated. The countenance is anxious, and the legs are rather drawn together than extended, as in bronchitis and pneumonia, and they are not colder than usual. There is a short hurried cough, with great restlessness, and the sides are always painful on pressure; but this symptom by itself is not to be relied on, as it is present in pleurodynia, which will be presently described.

The treatment should consist of copious bleeding, followed by a mild purgative, and the same ball as recommended for pneumonia, with the addition of half a drachm of calomel. Blisters are not desirable to be applied to the sides of the thorax, as there is so little space between the two surfaces of the pleura and the skin that they are apt to do harm by immediately irritating the former, rather than to act beneficially by counter-irritation of the skin. A large rowel, may, however, be placed in the breast with advantage.

HYDROTHORAX, or water in the cavity of the chest, is one of the sequels of chronic pleurisy, the serum thrown out being the means by which a serous membrane relieves itself. It can be detected by the entire absence of respiratory murmur, and by the dullness on percussion. No *treatment* is of any avail but tapping, which may be readily and safely performed (if the diagnosis is correct) by passing a trocar between the eighth and ninth ribs, near their cartilages. If, however, an error has been committed, the lung is wounded, and death will probably ensue.

PLEURODYNIA.

BETWEEN THIS DISEASE AND THE LAST there is some similarity in the symptoms; but in their nature, and in the treatment required, they are widely separated. It is, therefore, necessary that they should not be confounded, for in the one case blood-letting and other active measures may be unnecessarily adopted, and in the other a fatal result will most probably occur for want

or them. In pleuritis there is a quick pulse, with general constitutional disturbance, which will serve to distinguish it from pleurodynia, besides which, it is rarely that we meet with the former without some other affection of the lungs co-existing. When, therefore, a horse is evidently suffering from acute pain in the walls of the thorax, unaccompanied by cough, hurried breathing, quick pulse, or fever, it may safely be diagnosed that the nature of the attack is a rheumatism of the intercostal muscles (pleurodynia), and not pleurisy. In *treating* it, bleeding and tartar emetic must be carefully avoided, and hot mustard and vinegar rubbed into the sides will be the most likely remedy to afford relief.

PHTHISIS.

WHEN A HORSE HAS LONG BEEN SUBJECT TO A CHRONIC COUGH, and, without losing appetite, wastes away rapidly, it may be assumed that he is a victim to phthisis, and especially if he is narrow-chested and has long shown signs of short wind. On examining the chest by the ear, it will be found to give out sounds of various kinds, depending upon the exact state of the lungs; but in most cases there will be great dulness on percussion, owing to the deposit of tubercles, in which the disease consists. In a confirmed case no *treatment* will avail, and the poor animal had better be destroyed. When the attack is slight, the progress of the disease may be stayed by counteracting inflammation in the ordinary way, avoiding loss of blood when possible. Hæmorrhage, from the breaking down of the substance of the lung, by which a large blood-vessel is opened, is a common result of phthisis, and will be alluded to under the head of diseases of the vessels of the lungs, at the end of this chapter.

BROKEN WIND.

A BROKEN-WINDED HORSE can be detected at once by any horseman possessed of experience, from the peculiar and forcible double expiration. Inspiration is performed as usual, then comes a rapid but not violent act of expiration, followed by a forcible repetition of the same, in which all the muscles of respiration, auxiliary and ordinary, are called into play. This is, of course, most marked when the horse has been galloped, but even when he is at rest the double expiration is manifest at almost any ordinary distance from the observer. The disease almost (if not quite) invariably consists in emphysema, or entrance of the air into unnatural cells, which is retained there, as the urine is in the bladder, from the valvular nature of the openings, and cannot be entirely expelled, nor in the slightest degree, without calling into play all the muscles of the chest. The presence of unchanged air is a constant source of irritation to the lungs, and although suffi-

cient may be expired easily enough to carry on their functions while the body is at rest, yet instinctively there is a desire to get rid of the surplus, and hence the two acts of respiration. Immediately after this second act the muscles relax, and the flank falls in, and this it is which catches the eye in so remarkable a manner. On examination after death, the lungs are found to remain enlarged, and do not collapse as in the healthy condition. They are distended with air; and this is especially the case when the emphysema is of the kind called interlobular, in which the air has escaped into the cellular membrane. In the most common kind, however, the cells are broken down, several being united together, while the enlargement pressing upon the tube which has opened into them diminishes its capacity, and prevents the ready escape of air. This is the vesicular emphysema of pathologists. The former is generally suddenly produced by a severe gallop after a full meal, while the latter is a slow growth and often occurs at grass, as a consequence of neglected chronic cough, the constant muscular efforts appearing gradually to dilate the cells.

The treatment can only be palliative, as there is no recognised cure for the disease, though M. Hew, of Chaumont, has lately published a report of ten cases in which treatment by arsenic given with green food or straw, and in some cases bleeding, was perfectly successful. The arsenic was given to the extent of fifteen grains daily, and at the end of a fortnight the symptoms of broken wind were completely removed; but as the horses were not subsequently watched, it is impossible to say whether the cure was permanent. It is known, however, that one of them relapsed after three months, but speedily yielded to a repetition of the treatment. It may certainly be worth while to try the experiment of the effect of arsenic where a broken-winded horse is valuable in other respects. The medicine is not expensive, and the length of time necessary for the treatment is not very great. Broken-winded horses should be carefully dieted, and even then confined to slow work. The food should be in small compass, consisting chiefly of wheat-straw chaff, with a proper quantity of oats, and beans may be added if the animal is not very young. The water should never be given within an hour of going out of the stable, but it is better to leave a constant supply, when too much will never be taken. Carrots are peculiarly suited to this disease, and a diet of bran mixed with carrots, sliced, has sometimes been known to relieve a broken-winded horse most materially.

THICK WIND.

THICK WIND is the horseman's term for any defective respiration, unaccompanied by a noise, or by the signs of emphysema just alluded to. It usually follows pneumonia, but it may arise from

chronic bronchitis, occasioning a thickening of the mucous membrane lining the bronchial tubes, and thus lessening their diameter, or it may accompany phthisis when the deposit of tubercles is extensive. No *treatment* will be of any service except such as will aid the play of the lungs mechanically, by avoiding overloading the stomach, as mentioned in the last section.

SPASM OF THE DIAPHRAGM.

SOME HORSES, when at all distressed by the severity of their gallops, communicate to the rider a most unpleasant sensation, as if some internal part was giving a sudden blow or flap. This is not only a sensation, but a reality, for the diaphragm being naturally weak, or overstrained at some previous period, acts spasmodically in drawing in the air. If the horse thus affected is ridden onwards afterwards, he will be placed in danger of suffocation and death, either from rupture of the diaphragm, or from its cessation to act, or from its permanently contracting and refusing to give way during expiration. There is no cure for the weakness which tends to produce the spasm, and all that can be done is to avoid using the horse affected with it at any very fast pace, and over a distance of ground. Urgent *symptoms* may be relieved by a cordial-drench, such as the following :—

Take of Laudanum	6 drachms.
Ether	1½ ounce.
Aromatic Spirit of Ammonia . . .	3 drachms.
Tincture of Ginger	3 drachms.
Ale	1 pint. Mix.

Or if there is any difficulty in giving a drench, a ball may be made up and given—

Take of Carbonate of Ammonia	1 drachm.
Camphor	½ drachm.
Powdered Ginger	1 drachm.
Linseed meal and boiling water sufficient to make into a ball.	

Either of the above may be repeated at the end of three hours, if relief is not afforded. Increased strength may be given to the diaphragm by regular slow work, and the daily mixture of a drachm of powdered sulphate of iron with the feed of corn.

DISEASES OF THE HEART.

THE HORSE is subject to inflammation of the substance of the heart (carditis) of a rheumatic nature, and of the fibro-serous covering (pericarditis), but the symptoms are so obscure that no one but the professional veterinarian will be likely to make them out. Dropsy of the heart is a common disease in worn-out horses, and hypertrophy, as well as fatty degeneration, are often met with among well-conditioned animals.

DISEASES OF THE BLOOD-VESSELS OF THE CHEST
AND NOSE.

THE HORSE IS VERY SUBJECT TO HÆMORRHAGE from the nose, coming on during violent exertion, and many a race has been lost from this cause. Fat over-fed horses are the most likely to suffer from hemorrhage; but most people are aware of the risk incurred in over-riding or driving them, and for this reason they are not so often subject to this accident (for such it is rather than a disease) as they otherwise would be. It is unnecessary to describe its *symptoms*, as the gush of blood renders it but too apparent, and the only point necessary to inquire into is, whether the lungs or the nasal cavities are the seat of the rupture of the vessel. In the former case the blood comes from both nostrils, and is frothy; while in the latter it generally proceeds from one only, and is perfectly fluid. The *treatment* should consist in cooling the horse down by a dose of physic and a somewhat lower diet; but if the bleeding is very persistent, and returns again and again, a saturated solution of alum in water may be syringed up the nostril daily, or, if this fails, an infusion of matico may be tried, which is far more likely to succeed. It is made by pouring half a pint of boiling water on a drachm of matico-leaves, and letting it stand till cool, when it should be strained, and is fit for use.

HÆMORRHAGE FROM THE LUNGS is a far more serious affair, and its control requires active remedies if they are to be of any service. It may arise from the existence of an abscess in the lung of a phthisical nature, which implicates some considerable vessel; or it may be caused by the bursting of an aneurism, which is a dilatation of a large artery, and generally occurs near the heart. The *treatment* can seldom do more than prolong the life of the patient for a short time, and it is scarcely worth while to enter upon it. Bleeding from the jugular vein will arrest the internal hæmorrhage, and must often be resorted to in the first instance, and there are internal medicines which will assist it, such as digitalis and matico; but, as before remarked, this only postpones the fatal termination.



CHAPTER IV.

DISEASES OF THE ABDOMINAL VISCERA AND THEIR APPENDAGES

General remarks—Diseases of the Mouth and Throat—Gastritis—Stomach Staggers—Dyspepsia—Bots—Inflammation of the Bowels—Colic—Diarrhœa and Dysentery—Strangulation and Rupture—Calculi in the Bowels—Worms—Disease of the Liver—of the Kidneys—of the Bladder—of the Organs of Generation.

GENERAL REMARKS.

THOUGH NOT OFTEN PRODUCING what in horse-dealing is considered unsoundness, yet diseases of the abdominal viscera constantly lead to death, and frequently to such a debilitated state of the body, that the sufferer is rendered useless. Fortunately for the purchaser, they almost always give external evidence of their presence, for there is not only emaciation, but also a staring coat and a flabby state of the muscles, which is quite the reverse of the wiry feel communicated to the hand in those instances where the horse is "poor" from over-work in proportion to his food. In the latter case, time and good living only are required to restore the natural plumpness; but in the former, the wasting will either go on until death puts an end to the poor diseased animal, or he will remain in a debilitated and wasted condition, utterly unfit for hard work.

DISEASES OF THE MOUTH AND THROAT.

SEVERAL PARTS ABOUT THE MOUTH are liable to inflammation, which would be of little consequence in itself, but that it interferes with the feeding, and this for the time starves the horse, and renders him unfit for his work, causing him to "quid" or return his food into the manger without swallowing it. Such are lampas, vives or enlarged glands, barbs or paps, gigs, bladders, and flaps,—all which are names given to the enlargements of the salivary ducts,—and carious teeth, or inflammation of their fangs. Besides these, the horse is also subject to sore throat, and strangles, which are accompanied by constitutional disturbance, and not only occasion "quidding," if there is any slight appetite, but they are also generally accompanied by a loss of that function.

SORE THROAT.—When the throat inflames, as is evidenced by fulness and hardness of this part, and there is difficulty of swallowing, the skin covering it should immediately be severely sweated, or the larynx will be involved and irreparable injury done. The tincture of cantharides diluted with an equal part of spirit of tur-

pentine and a little oil, may be rubbed in with a piece of sponge, until it produces irritation of the skin, which in a few hours will be followed by a discharge from the part. Six or eight drachms of nitre may also be dissolved in the water which the horse drinks, with some difficulty, but still, as he is thirsty, he will take it. Sometimes eating gives less pain than drinking, and then the nitre may be given with a bran mash instead of the water.

STRANGLES.—Between the third and fifth year of the colt's life he is generally seized with an acute swelling of the soft parts between the branches of the lower jaw, accompanied by more or less sore throat, cough and feverishness. These go on increasing for some days, and then an abscess shows itself, and finally bursts. The salivary glands are often involved, but the matter forms in the cellular membrane external to them. The *treatment* should be addressed to the control of constitutional symptoms by the mildest measures, such as bran mashes with nitre in them, abstraction of corn, hay tea, &c. At the same time the swelling should be poulticed for one night, or thoroughly fomented two or three times, and then blistered with the tincture of cantharides. As soon as the matter can plainly be felt, it may be let out with a lancet; but it is very doubtful whether it is not the best plan to permit the abscess to break. The bowels should be gently moved, by giving a pint, or somewhat less, according to age, of castor oil; and afterwards two or three drachms of nitre, with half a drachm of tartar emetic, may be mixed with the mash twice a day, on which food alone the colt should be fed, in addition to gruel, and a little grass or clover if these are to be had, or if not, a few steamed carrots. The disease has a tendency to get well naturally, but if it is not kept within moderate bounds it is very apt to lay the foundation of roaring or whistling. Any chronic swelling which is left behind, may be removed by rubbing in a weak ointment of biniodide of mercury (one scruple or half drachm to the ounce; see page 300).

LAMPAS is an active inflammation of the ridges, or "bars," in the hoof of the mouth, generally occurring in the young horse while he is shedding his teeth, or putting up the tushes. Sometimes, however, it comes on, independently of this cause from over-feeding with corn after a run at grass. The mucous membrane of the roof of the mouth swells so much that it projects below the level of the nippers, and is so tender that all hard and dry food is refused. The *treatment* is extremely simple, consisting in the scarification of the part with a sharp knife or lancet, after which the swelling generally subsides, and is gone in a day or two; but should it obstinately continue, as will sometimes happen, a stick of lunar caustic must be gently rubbed over the part every day until a cure is completed. This is far better than

the red-hot iron, which was formerly so constantly used, with good effect it is true, and not accompanied by any cruelty, as the mucous membrane is nearly insensible, but the caustic is more rapid and effectual in stimulating the vessels to a healthy action, and on that score should be preferred. If the lampas is owing to the cutting of a grinder, relief will be afforded by a crucial incision across the protruding gum.

BARBS, PAPS, &c.—The swelling at the mouth of the ducts may generally be relieved by a dose of physic and green food, but should it continue, a piece of lunar caustic may be held for a moment against the opening of the duct every second day, and after two or three applications the thickening will certainly disappear.

WHERE VIVES, or chronically enlarged submaxillary glands, are met with, the application of the ointment of biniodide of mercury, according to the directions given at page 300, will almost certainly cause their reduction to a natural state.

GASTRITIS.

GASTRITIS (acute inflammation of the stomach) is extremely rare in the horse as an idiopathic disease; but it sometimes occurs from eating vegetable poisons as food, or from the wilful introduction of arsenic into this organ, or, lastly, from licking off corrosive external applications, which have been used for mange. The *symptoms* from poisoning will a good deal depend upon the article which has been taken, but in almost all cases in which vegetable poisons have been swallowed, there is a strange sort of drowsiness, so that the horse does not lie down and go to sleep, but props himself against a wall or tree with his head hanging almost to the ground. As the drowsiness increases he often falls down in his attempt to rest himself more completely, and when on the ground his breathing is loud and hard, and his sleep is so unnaturally sound that he can scarcely be roused from it. At length convulsions occur and death soon takes place. This is the ordinary course of poisoning with yew, which is sometimes picked up with the grass after the clippings have dried, for in its fresh state the taste is too bitter for the palate, and the horse rejects the mouthful of grass in which it is involved. May-weed and water parsley will also produce nearly similar symptoms. The *treatment* in each case should be by rousing the horse mechanically, and at the same time giving him six or eight drachms of aromatic spirit of ammonia, in a pint or two of good ale, with a little ginger in it. This may be repeated every two hours, and the horse should be perpetually walked about until the narcotic symptoms are completely gone off, when a sound sleep will restore him to his natural state.

ARSENIC, when given in large doses, with an intention to destroy

life, produces intense pain and thirst ;—the former, evidenced by an eager gaze at the flanks, pawing of the ground, or rolling ; and sometimes by each of these in succession. The saliva is secreted in increased quantities, and flows from the mouth, as the throat is generally too sore to allow of its being swallowed. The breath soon becomes hot and fetid, and purging then comes on of a bloody mucus, which soon carries off the patient by exhaustion, if death does not take place from the immediate effects of the poison on the stomach and brain. *Treatment* is seldom of any avail, the most likely remedies being large bleedings, blisters to the sides of the chest, and plenty of thin gruel to sheathe the inflamed surface of the mucous membrane, which is deprived of its epithelial scales.

CORROSIVE SUBLIMATE is sometimes employed as a wash in mange, or to destroy lice, when it may be licked off, and will occasion nearly the same symptoms as arsenic. The *treatment* consists in a similar use of thin starch or gruel ; or, if the poison has recently been given wilfully, of large quantities of white of egg.

STOMACH STAGGERS.

THE EXACT NATURE of this disease has never been clearly made out, and it is now so rare, that there is little chance of its being satisfactorily explained. The symptoms would chiefly lead one to suppose the brain to be implicated ; but there is so close a sympathy between that organ and the stomach, that we can easily account in that way for the cerebral manifestations. A theory has been propounded, that it is seated in the par vagum, or pneumogastric nerve ; and as all the parts with which that nerve is connected are affected, there is some ground for the hypothesis ; but it is not supported by the demonstration of anatomy, simply, perhaps, because of the difficulty in the way of prosecuting the pathology of the nerves. The first onset of the disease is marked by great heaviness of the eyes, soon going on to drowsiness ; the head dropping into the manger, even while feeding is in progress. It generally makes its appearance after a long fast ; and it is supposed by some writers to be owing to the demands made by the stomach on the brain, when in an exhausted condition for want of its usual supplies. This theory is supported by the fact that, in the present day, when every horsemaster knows the danger of working his horses without feeding them at intervals of five, or at most six hours, the stomach staggers are almost unknown. Even when the disease shows itself at grass, it is almost always mani-

fested directly after the horse is first turned out, when he gorges himself with the much-covered food, which has long been withheld, and his brain is affected in a manner similar to that which follows a long fast from every kind of food. In a short time, if the affection of the brain is not relieved, that organ becomes still more severely implicated, and convulsions or paralysis put an end to the attack. During the course of the disease, the breathing is affected, and there is generally an almost total cessation of the secretions of bile and urine, which may either be the cause or the effect of the condition of the brain. With this state of uncertainty as to the essence of the disease, it is somewhat empirical to lay down any rules for its *treatment*; and, as I before remarked, it is now so rare, that they are scarcely necessary. If care be taken to feed the horse properly, he will never suffer from stomach staggers in the stable; and at grass, the attack is seldom observed until he is beyond the reach of any remedies. Still, it may be as well to observe, that the usual plan of proceeding has been to take away blood, so as to relieve the brain, and to stimulate the stomach to get rid of its load, by the use of warm aperients, such as the following:—

Take of Barbadoes Aloes 4 to 6 drachms.

Tincture of Ginger 3 drachms.

Dissolve the aloes in a pint of hot water, then add the tincture, and when nearly cool give as a drench.

DYSPEPSIA.

EVERY DOMESTIC ANIMAL suffers in health if he is constantly fed on the same articles, and man himself, perhaps, more than they do. Partridges are relished by him early in September, but *toujours perdrix* would disgust the most inveterate lover of that article of food. Dogs are too often made to suffer from being fed on the same meal, flavored with similar flesh or broth, from one month to another. It is well known that cattle and sheep must change their pasture, or they soon lose condition; and yet horses are expected to go on eating oats and hay for years together without injury to health; and at the same time they are often exposed to the close air of a confined stable, and to an irregular amount of exercise. We cannot, therefore, wonder that the master is often told that some one or other of his horses is “a little off his feed;” nor should we be surprised that the constant repetition of the panacea for this, “a dose of physic,” should at length permanently establish the condition which at first it would always alleviate. It is a source of wonder that the appetite continues so good as it

does, in the majority of horses, which are kept in the stable on the same kind of food, always from July to May, and often through the other months also. The use of a few small bundles of vetches, lucerne, or clover in the spring, is supposed to be quite sufficient to restore tone to the stomach, and undoubtedly they are better than no change at all; but at other seasons of the year something may be done towards the prevention of dyspepsia, by varying the quality of the hay, and by the use of a few carrots once or twice a week. In many stables, one rick of hay is made to serve throughout the whole or a great part of the year, which is a very bad plan, as a change in this important article of food is as much required as a change of pasture when the animal is at grass. When attention is paid to this circumstance, the appetite will seldom fail in horses of a good constitution, if they are regularly worked; but without it, resort must occasionally be had to a dose of physic. It is from a neglect of this precaution that so many horses take to eat their litter, in preference to their hay; for if the same animal was placed in a straw-yard, without hay, for a month, and then allowed access to both, there would be little doubt that he would prefer the latter. Some horses are naturally so voracious, that they are always obliged to be supplied with less than they desire, and they seldom suffer from loss of appetite; but delicate feeders require the greatest care in their management. When the stomach suffers in this way, it is always desirable to try what a complete change of food will do before resorting to medicine; and, if it can be obtained, green food of some kind should be chosen, or if not, carrots, or even steamed potatoes. In place of hay, sound wheat or barley straw may be cut into chaff, and mixed with the carrots and corn; and to this a little malt-dust may be added, once or twice a week, so as to alter the flavor. By continually changing the food in this way, the most dyspeptic stomach may often be restored to its proper tone, without doing harm with one hand while the other is doing good, as is too often the case with medicine. The use of the fashionable "horse-feeds" of the present day will serve the same purpose; and if the slight changes I have mentioned do not answer, Thorley's or Henri's food may be tried with great probability of success.

BOTS.

THE LARVÆ of the *æstrus equi*, a species of gadfly, are often found in large numbers, attached by a pair of hooks with which they are provided, to the cardiac extremity of the stomach; they are very rarely met with in the true digestive portion of this organ, but sometimes in the duodenum or jejunum in small numbers. A group of these larvæ, which are popularly called bots, are represented on the next page, but sometimes nearly all the cardiac ex-

tremity of the stomach is occupied with them, the interstices being occupied by little projections which are caused by those that have let go their hold, and have been expelled with the food. Several of these papillæ are shown on the engraving, which delineates also the appearance of the bots themselves, so that no one can fail to recognise them when he sees them. This is important, for it often

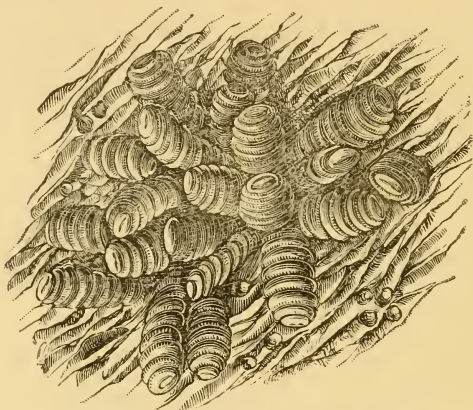


FIG. 18.—GROUP OF BOTS ATTACHED TO THE STOMACH.

happens that a meddlesome groom when he sees them expelled from or hanging to the verge of the anus, as they often do for a short time, thinks it necessary to use strong medicine; whereas in the first place he does no good, for none is known which will kill the larva without danger to the horse, and in the second, if he will only have a little patience, every bot will come away in the natural course of things, and until the horse is turned out to grass, during the season when the *æstrus* deposits its eggs, he will never have another in his stomach.

THE *ÆSTRUS EQUI* comes out from the pupa state in the middle and latter part of summer, varying according to the season, and the female soon finds the proper nidus for her eggs in the hair of the nearest horse turned out to grass. She manages to glue them to the sides of the hair so firmly that no ordinary friction will get rid of them, and her instinct teaches her to select those parts within reach of the horse's tongue, such as the hair of the fore legs and sides. Here they remain until the heat of the sun hatches them, when, being no larger in diameter than a small pin, each larva is licked off and carried down the gullet to the stomach, to the thick epithelium of which it soon attaches itself by its hooks. Here it remains until the next spring, having attained the size

which is represented in the engraving during the course of the first two months of its life, and then it fulfils its allotted career, by letting go and being carried out with the dung. On reaching the outer air it soon assumes the chrysalis condition, and in three or four weeks bursts its covering to become the perfect insect.

FROM THIS HISTORY it will be evident that no preventive measures will keep off the attacks of the fly when the horse is at grass, and, indeed, in those districts where they abound, they will deposit their ova in the hair of the stabled horse if he is allowed to stand still for a few minutes. The eggs are, however, easily recognised in any horse but a chestnut, to which color they closely assimilate, and as they are never deposited in large numbers on the stabled horse they may readily be removed by the groom. Unlike other parasites, they seem to do little or no harm, on account of the insensible nature of the part of the stomach to which they are attached, and, moreover, their presence is seldom discovered until the season of their migration, when interference is uncalled for. On all accounts, therefore, it is unnecessary to enter into the question, whether it is possible to expel them; and even if by chance one comes away prematurely it will be wise to avoid interfering by attempting to cause the expulsion of those left behind.

INFLAMMATION OF THE BOWELS.

(*Peritonitis and Enteritis.*)

A REFERENCE to the cut of the abdomen and its contents, opposite page 350, will explain that there are two divisions of the abdominal serous sac, one of which lines the walls of the cavity, and the other covers the viscera which lie in it. In human medicine, when the former is inflamed, the disease is termed *peritonitis*, and when the latter is the subject of inflammatory action it is called *enteritis*. But though in theory this distinction is made, in practice it is found that the one seldom exists without the other being developed to a greater or less extent. Veterinary writers have generally taken the nomenclature adopted in human anatomy and pathology, but in regard to the inflammations of the bowels they define *peritonitis* as inflammation of the peritoneal or serous coat, and *enteritis* as inflammation of the muscular coat. My own belief is, that during life it is impossible by any known symptoms to distinguish the exact *locale* of any inflammation of the bowels but that of their mucous lining, which will presently be described, and that wherever the actual serous covering of the bowels is involved the muscular fibres beneath it will be implicated, but that the serious and fatal symptoms manifested in such cases are not dependent upon the latter, but are due entirely to the lesions of the serous coat. I have examined numberless fatal

cases of supposed enteritis, and have uniformly found signs of inflammation of the serous investment, sometimes implicating the muscular fibres beneath, and often extending to the peritoneal lining of the walls of the abdomen, but I have never yet seen marks of inflammation in the muscular tissue without their serous covering being affected to a much greater extent. I believe therefore that the distinction is erroneously founded, and that, theoretically, the same definition should be made of the two diseases as is in use by human pathologists, though practically this is of little importance. There is no well made out inflammation of muscular tissue (except that of the heart) in which the symptoms are so urgent and so rapidly followed by a fatal issue as in the latter stages of the disease described by Mr. Percivall under the head *enteritis*, as follows:—"The next stage borders on delirium. The eye acquires a wild, haggard, and unnatural stare—the pupil dilates—his heedless and dreadful throes render approach to him quite perilous, he is an object not only of compassion but of apprehension, and seems fast hurrying to his end—when all at once, in the midst of agonizing torments he stands quiet, as though every pain had left him and he were going to recover. His breathing becomes tranquillized—his pulse sunk beyond all perception—his body bedewed with a cold clammy sweat—he is in a tremor from head to foot and about the legs and ears has even a dead-like feel. The mouth feels deadly chill—the lips drop pendulous, and the eye seems unconscious of objects. In fine, death, not recovery, is at hand. Mortification has seized the inflamed bowel—pain can no longer be felt in that which a few minutes ago was the seat of most exquisite suffering. He again becomes convulsed, and in a few more struggles less violent than the former he expires." Analogy would lead any careful pathologist to suppose that such symptoms as these are due to some lesion of a serous and not a muscular tissue, and, as I before remarked, I have satisfied myself that such is really the case. I have seen lymph, pus, and serum effused in some cases of enteritis, and mortification extending to a large surface of the peritoneal coat in others, but I have never examined a single case without one or the other of these morbid results. It may be said that so long as the symptoms are correctly described their exact seat is of no consequence; but in this instance it is probable that the ordinary definition of enteritis as an inflammation of the muscular coat may lead to a timid practice in its treatment, which would be attended with the worst results. I have no fault to find with the usual descriptions of the two diseases, or with their ordinary treatment, but I protest against the definition which is given of them.

AN EXAMINATION OF THE CAUSE of inflammation of the bowels is the only means by which the one form can be distinguished

from the other. If it has been brought about from exposure to cold, or from over-stimulating medicines given for colic, the probability is that the serous covering of the intestines themselves is chiefly involved; while if it has followed castration it may generally be concluded that the peritoneal lining of the abdominal muscles has taken on inflammatory action by an immediate extension from the serous lining of the inguinal canal, which is continuous with it. In each case, however, the symptoms are as nearly as may be the same, and without knowing the previous history I believe no one could distinguish the one disease from the other—nor should the treatment vary in any respect.

THE SYMPTOMS of peritoneal inflammation vary in intensity, and in the rapidity of their development, but they usually show themselves in the following order:—At first there is simple loss of appetite, dulness of eye, and a general uneasiness, which are soon followed by a slight rigor or shivering. The pulse becomes rapid, but small and wiry, and the horse becomes very restless, pawing his litter, and looking back at his sides in a wistful and anxious manner. In the next stage all these signs are aggravated; the hind legs are used to strike at but not touch the belly; and the horse lies down, rolls on his back and struggles violently. The pulse becomes quicker and harder, but is still small. The belly is acutely tender and hard to the touch, the bowels are costive, and the horse is constantly turning round, moaning, and regarding his flanks with the most anxious expression of countenance. Next comes on the stage so graphically described by Mr. Percivall in the passage which I have quoted, the whole duration of the attack being from twelve to forty eight hours in acute cases, and extending to three or four days in those which are denominated sub-acute.

In the treatment of this disease, as in all those implicating serous membrane, blood must be taken largely, and in a full stream, the quantity usually required to make a suitable impression being from six to nine quarts. The belly should be fomented with very hot water, by two men holding against it a doubled blanket, dipped in that fluid, which should be constantly changed, to keep up the temperature. The bowels should be back-raked, and the following drench should be given every six hours till it operates, which should be hastened by injections of warm water.

Take of Linseed oil	1 pint.
Laudanum	2 ounces.

If the first bleeding does not give relief in six or eight hours, it must be repeated to the extent of three or four quarts, and at the same time some liquid blister may be rubbed into the skin of the abdomen, continuing the fomentations, at short intervals, under

that part, which will hasten its operation. The *diet* should be confined to thin gruel or bran mashcs, and no hay should be allowed until the severity of the attack has abated.

TO DISTINGUISH this disease from colic is of the highest importance, and for this purpose it will be necessary to describe the symptoms of the latter disease, so as to compare the two together

COLIC.

IN THIS DISEASE there is spasm of the muscular coat of the intestines, generally confined to the cæcum and colon. Various names have been given to its different forms, such as the fret, the gripes, spasmodic colic, flatulent colic, &c, but they all display the above feature, and are only modifications of it, depending upon the cause which has produced it. In spasmodic colic, the bowels are not unnaturally distended, but in flatulent colic their distension by gas brings on the spasm, the muscular fibres being stretched to so great an extent as to cause them to contract irregularly and with a morbid action. Sometimes, when the bowels are very costive, irritation is established as an effort of nature to procure the dislodgment of the impacted fæcal matters, and thus a third cause of the disease is discovered. The exact nature and cause are always to be ascertained from the history of the case, and its symptoms, and as the treatment will especially be conducted with a view to a removal of the cause, they are of the highest importance. *The symptoms* in all cases of colic, by which it may be distinguished from the last-described disease, are as follows: In both acute pain is manifested by stamping, looking at the flanks, and rolling; but in enteritis the pain is constant, while in colic, there are intervals of rest, when the horse seems quite easy, and often begins to feed. In both the poor animal strikes at his belly; but in the former he takes great care not to touch the skin, while in the latter (colic) he will often bring the blood by his desperate efforts to get rid of his annoyance. In enteritis the belly is hot and exquisitely tender to the touch, but in colic it is not unnaturally warm, and gradual pressure with a broad surface, such as the whole hand, always is readily borne, and generally affords relief. The pulse also is little affected in colic; and, lastly, the attack is very much more sudden than in peritoneal inflammation.

SUCH ARE THE GENERAL SIGNS by which a case of colic may be distinguished from inflammation of the bowels, but beyond this it is necessary to investigate whether it is pure spasmodic colic, or produced by flatulence, or by an obstruction in the bowels.

IN SPASMODIC COLIC all the above symptoms are displayed, without any great distension of the abdomen; and if the history of the case is gone into, it will be found that after coming in heated the horse has been allowed to drink cold water, or has been exposed in an exhausted state to a draught of air.

IN FLATULENT COLIC the abdomen is enormously distended; the attack is not so sudden, and the pain is not so intense, being rather to be considered, in the average of cases, as a high degree of uneasiness, occasionally amounting to a sharp pang, than giving the idea of agony. In aggravated attacks, the distension is so enormous as to leave no doubt of the nature of the exciting cause. Here also the spasms are often brought on by drinking cold water while the horse is in a heated and exhausted state.

WHERE THERE IS A STOPPAGE IN THE BOWELS to cause the spasm, on questioning the groom, it will be found that the dung for some days has been hard and in small lumps, with occasional patches of mucus upon it. In other respects there is little to distinguish this variety from the last.

The treatment must in all cases be conducted on a totally different plan to that necessary when inflammation is present. Bleeding will be of no avail, at all events in the early stages, and before the disease has gone on, as it sometimes will, into an inflammatory condition. On the other hand, stimulating drugs, which would be fatal in enteritis, will here generally succeed in causing a return of healthy muscular action. The disease is indeed similar in its essential features to cramp in the muscles of the human leg or arm, the only difference being that it does not as speedily disappear, because it is impossible to get at the muscular coat of the intestines, and apply the stimulus of friction.

AS SOON AS A CASE IS CLEARLY MADE OUT TO BE OF A SPASMODIC NATURE, one or other of the following drenches should be given, the choice being made in proportion to the intensity of the symptoms:—

1. Sulphuric Ether 1 ounce.
 Laudanum 2 ounces
 Compound decoction of Aloes 5 ounces
 Mix and give every half hour until relief is afforded.
2. Spirit of Turpentine 4 ounces.
 Linseed Oil 12 ounces.
 Laudanum 1½ ounce.
 Mix and give every hour till the pain ceases.
3. Aromatic Spirit of Ammonia 1½ ounce.
 Laudanum 2 ounces.
 Tincture of Ginger 1½ ounce.
 Hot Ale 1 quart.
 Mix and give every hour.

Hot water should also be applied to the abdomen, as described under the head of Enteritis, and if an enema pump is at hand, large quantities of water, at a temperature of 100° Fahrenheit, should be injected *per anum*, until in fact the bowel will hold no more without a dangerous amount of force.

IN FLATULENT COLIC the same remedies may be employed, but the turpentine mixture is here especially beneficial. The use of warm water injections will often bring away large volumes of wind, which at once affords relief, and the attack is cured. Sometimes, however, the distension goes on increasing, and the only chance of recovery consists in a puncture of the cæcum, as it lies high in the right flank, where, according to French veterinary writers it may often be opened when greatly distended, without dividing the serous covering. The operation, however, should only be performed by an experienced hand, as it is one of great danger, and a knowledge of the anatomy of the parts concerned is required to select the most available situation.

THE TREATMENT OF IMPACTION must be completely *a posteriori*, for all anterior proceedings with aperient medicines will only aggravate the spasms. Injection of gallons of warm water or of gruel containing a quart of castor oil and half a pint of spirit of turpentine, will sometimes succeed in producing a passage, and at the same time the spasm may be relieved by the exhibition at the mouth of one ounce of laudanum and the same quantity of sulphuric ether. If there is any tenderness of the abdomen, or the pulse has a tendency to quicken, it will be better to resort to bleeding, which alone will sometimes cause the peristaltic action to be restored in a healthy manner. The case, however, requires great patience and judgment, and as no great good can often be effected, it is highly necessary to avoid doing harm, which can hardly be avoided if the remedies employed are not at once successful.

WHEN THE URGENT SYMPTOMS of colic in any of its forms are relieved, great care must be exercised that a relapse does not take place from the use of improper food. The water should be carefully chilled, and a warm bran mash should be given, containing in it half a feed of bruised oats. Nothing but these at moderate intervals, in the shape of food or drink, should be allowed for a day or two, and then the horse may gradually return to his customary treatment, avoiding, of course, everything which may appear to have contributed to the development of colic.

DIARRHŒA AND DYSENTERY.

A DISTINCTION is attempted to be made between these two diseases,—the former name being confined to an inflammation of the mucous membrane of the small intestines, while the latter is said

to reside in the large. It is very difficult, however, if not impossible, to distinguish the one from the other by the symptoms during life, and in ordinary practice they may be considered as one disease, the treatment depending in great measure on the exciting cause. This in most cases is to be found in the use of too violent "physic," or in not resting the horse after it has begun to act until some hours after it has completely "set." Sometimes it depends on the cells of the colon having long been loaded with fæces, which causes, at length, their mucous lining to inflame, the consequent secretion having a tendency to loosen them and procure their dismissal, either by solution or by the forcible contraction of the muscular coat. This last disease is known by the name of "molten grease" to old-fashioned farriers, the clear mucus which envelopes the lumps of fæces being supposed to be derived from the internal fat that is generally plentifully developed in the highly fed horses that are especially subject to the attack. For practical purposes, therefore, we may consider the different forms under the head of superpurgation, diarrhœa, and dysentery, meaning by the last name that condition which is brought about by and attended with a discharge of lumps of hard fæcal matter enveloped in mucus.

SUPERPURGATION is sometimes so severe as to place a delicate horse in great danger. When the action of the bowels has gone on for three or four days consecutively, and there is no disposition to "set," the eyes become staring and glassy, the pulse is feeble, and the heart flutters in the most distressing manner; the mouth has a peculiarly offensive smell, the tongue being pale and covered with a white fur having a brown centre. The abdomen is generally tucked tightly up, but in the later stages large volumes of gas are evolved, and it becomes tumid.

The treatment should consist in the exhibition of rice, boiled till quite soft, and if not taken voluntarily, it should be given as a drench, mixed into a thin liquid form with warm water. If the case is severe, one or two ounces of laudanum may be added to a quart of rice milk, and given every time the bowels act with violence. Or a thin gruel may be made with wheat meal, and the laudanum be mixed with that instead of the rice. A perseverance in these remedies will almost invariably produce the desired effect, if they have not been deferred until the horse is very much exhausted, when a pint of port wine may be substituted for the laudanum with advantage.

IN DIARRHŒA resulting from cold, or over-exertion, the treatment should be exactly like that prescribed for superpurgation, but it will sometimes be necessary to give chalk in addition to the remedies there alluded to. The rice or flour-milk may be admini-

istered as food, and the following drench given by itself every time there is a discharge of liquid fæces :—

Take of Powdered Opium	1 drachm.
Tincture of Catechu	½ ounce.
Chalk Mixture	1 pint.
Mix and give as a drench.	

During the action of these remedies the body must be kept warm by proper clothing, and the legs should be encased in flannel bandages, previously made hot at the fire, and renewed as they become cold.

IN DYSENTERY (or molten grease) it is often necessary to take a little blood away, if there is evidence of great inflammation in the amount of mucus surrounding the fæces, and when aperient medicine does not at once put a stop to the cause of irritation by bringing the lumps away from the cells of the colon. Back-raking, and injections of two ounces of laudanum and a pint of castor oil with gruel, should be adopted in the first instance, but they will seldom be fully efficient without the aid of linseed oil given by the mouth. A pint of this, with half a pint of *good* castor oil, will generally produce a copious discharge of lumps, and then the irritation ceases without requiring any further interference.

Whenever there is diarrhœa or dysentery present to any extent, rice-water should be the sole drink.

STRANGULATION AND RUPTURE.

MECHANICAL VIOLENCE is done to the stomach and bowels in various ways, but in every case the symptoms will be those of severe inflammation of the serous coat, speedily followed by death, if not relieved when relief is possible. Sometimes the stomach is ruptured from over-distension—at others the small intestines have been known to share the same fate, but the majority of cases are due to strangulation of a particular portion of the bowels, by being tied or pressed upon by some surrounding band. This may happen either from a loop of bowel being forced through an opening in the mesentery or mesocolon, or from a band of organized lymph, the result of previous inflammation—or from one portion of the bowels forcing itself into another, like the inverted finger of a glove, and the included portion being firmly contracted upon by the exterior bowel, so as to produce dangerous pressure (intussusception), or, lastly, from a portion or knuckle of intestine forcing its way through an opening in the walls of the abdomen, and then called hernia or rupture, which being pressed upon by the edges of the opening becomes strangulated, and if not relieved inflames, and then mortifies. None of these cases are amenable to treatment (and indeed they cannot often be discovered with certainty during life, the symptoms resembling those of enteritis), except

strangulated hernia, which should be reduced either by the pressure of the hands, or by the aid of an operation with the knife—which will be described under the chapter which treats of the several operations. Whenever inflammation of the bowels is attended with obstinate constipation, the walls of the abdomen should be carefully examined, and especially the inguinal canal, scrotum, and navel, at which points in most cases the hernia makes its appearance. A swelling at any other part may, however, contain a knuckle of intestine, which has found its way through the abdominal parietes in consequence of a natural opening existing there, or of one having been made by some accidental puncture with a spike of wood or iron. The swelling is generally round, or nearly so, and gives a drum-like sound on being tapped with the fingers. It feels hard to the touch in consequence of the contents being constricted, but it gives no sensation of solidity, and may be generally detected by these signs. None but an educated hand can, however, be relied on to distinguish a ventral hernia from any other tumor. When it occurs at the scrotum or navel the case is clear enough.

CALCULI IN THE BOWELS.

A STOPPAGE IN THE BOWELS sometimes obstinately persists, in spite of all kinds of remedies, and, death taking place, it is found on examination that a large calculus has blocked up the area of the canal. Sometimes one of these calculi is found in the stomach, but this is extremely rare. On making a section they are found to consist of concentric layers of bran, chaff, and other hard particles of the food, mixed generally with some small proportion of earthy matter, and arranged around some foreign body, such as a piece of stone from the corn, or the head of a nail. Treatment is out of the question, as it is impossible to discover the calculus during life, and even if it could be ascertained to exist, no remedy is known for it. Those who are curious about the composition of these calculi, will be pleased with the following letter by Mr. Buckland, surgeon to the 1st Life Guards, in reply to an inquiry made in *The Field* as to the composition of a calculus found in a horse belonging to a correspondent:—

“Mr. C. Pemberton Carter having, in his interesting letter, requested me to throw some light upon this subject, I have great pleasure in giving what little information I am able to afford, with apologies for delay, as Aldershot camp is by no means a favorable spot for scientific investigations or literary pursuits. As regards the actual composition of calculi such as he has sent, we learn from the catalogue of the museum of the Royal College of Surgeons that they are composed for the most part of the phosphate of magnesia and ammonia, with small quantities of phosphate of

lime. They also contain an animal and extractive matter, to which the brown color of the calculus is owing. They also contain muriates of soda, and various alkaline salts derived from the intestinal juices. The animal matter resembles that of all other concretions, and separates in concentric laminæ when the calculus is dissolved in an acid. In more impure varieties, grains of sand, portions of hay, straw, &c., are frequently found imbedded in the calculus, and there is one specimen in the museum which contains an entire layer of vegetable hairs. Mr. Carter remarks that 'his impression is that the calculus is made up of bran' (chemically speaking). He is not far wrong, for we read in the College catalogue, 'Most authorities agree that these calculi are formed from phosphate of magnesia, contained in wheat, oats, hay, &c., and this opinion derives confirmation from the circumstance that they occur most frequently in *millers' and brewers' horses*, which are fed upon grains, bran, and substances known to contain a much larger proportion of magnesian salts than other vegetable matters.' Mr. Carter has detected minute portions of wheat, oats, and hay in the calculus, which therefore may be said to consist of two substances, viz., the vegetable and the mineral. So much, then, for the composition of the calculus; now for its mechanical structure. Most decidedly it may be compared to an onion, layer being packed over layer, so as in section to present a ringed appearance. We may also liken it to other objects. It has lately struck me to examine the structure of a common cricket-ball, which combines hardness, lightness, and elasticity in such an admirable way. Upon making a section, I found the cricket-ball to be composed of layers, one over the other, round a central nucleus. The layers are composed of leather, alternated with a vegetable fibre, the nucleus being a bit of cork. The calculus in the horse is formed in a similar way. The nucleus in Mr. Carter's specimen is a bit of flint; in a capital instance I have in my own collection, of a common shot, about No. 5 size, which has been crushed by the horse's teeth, and subsequently swallowed; in another instance, of a chair nail of brass; in another of a single oat-seed; in another of a minute bit of cinder, and so on, as it seems to be absolutely necessary that these calculi should have a commencement—a starting-point. Where is the school-boy who can make a gigantic snowball without beginning with a small lump of snow or a stone, as a nucleus upon which he builds all the rest?

"Mr. Carter seems to wonder at the weight of the specimen, 5 lbs.; this is by no means a large size; in the museum of the Royal College of Surgeons we have a very fine collection of calculi, the largest, taken from the intestines of a horse, weighs no less than 17 lbs., and is about the size and shape of an ordinary skittle-ball. In the case where this is contained he will see many

other specimens, cut in sections to show the nuclei; he will observe that calculi also form in the intestines of the camel and of the elephant, and even in the wild horse, for there is a good specimen from the intestines of a Japanese wild horse. Stones, not true calculi, are sometimes found in animals, which have been actually swallowed by them, and have not been chemically formed in this walking laboratory. There is a case containing several pebbles—thirty in number—found in the stomach of a cow at Barton-under-Needwood, Burton-on-Trent. These stones belong to the geological formation of the neighborhood; it is curious to see how they have been acted on by the action of the stomach, for they are highly glazed and polished. I have seen specimens of gravel pebbles which I took from the gizzard of an ostrich, which are as highly polished as an agate marble. The bird swallowed the stones to assist its digestion; the cow out of a morbid appetite. I know of a somewhat similar instance that lately happened: A young lady was taken ill, and died of very strange symptoms; it was subsequently ascertained that the stomach was quite filled with human hair, which had moulded itself into the shape of the interior of that organ. The poor girl had naturally very long and beautiful hair, and she had an unfortunate habit of catching the loose hairs with her lips and swallowing them; in time they felted together, became a solid mass, and killed her—a warning to other young ladies which should not be neglected. In the lower animals we frequently find rolled balls of hair from the creatures licking themselves. I have seen one at Bristol from a lioness; it is formed of hairs licked with her rough tongue from her cubs. Curious concretions are found in goats, &c., called ‘bezoar’ stones; they were formerly supposed to have medicinal virtues: of this at another time.

F. T. BUCKLAND.”

WORMS.

INTESTINAL WORMS in the horse are chiefly of two species, both belonging to the genus *ascaris*. Bots, as inhabiting the stomach, have already been described with that organ; and, moreover, they should never be confounded with what are called properly and scientifically, “worms.” Of these, the larger species resembles the common earthworm in all respects but color, which is a pinkish white. It inhabits the small intestines, though it is sometimes, but very rarely, found in the stomach. The *symptoms* are a rough, staring, hollow coat—a craving appetite—more or less emaciation—the passage of mucus with the fæces, and very often a small portion of this remains outside the anus, and dries there. That part generally itches, and in the attempt to rub it the tail is denuded of hair; but this may arise from vermin in it, or from mere irritation of the anus from other causes. When these several symp-

toms are combined, it may with some degree of certainty be supposed that there are worms in the intestines, but before proceeding to dislodge them, it is always the wisest plan to obtain proof positive of their existence, by giving an ordinary dose of physic, when, on watching the evacuations, one or more worms may generally be discovered if they are present. When the case is clearly made out the plan of *treatment* is as follows:—

Take of Tartar Emetic 1 drachm.
 Powdered Ginger $\frac{1}{2}$ drachm.
 Linseed Meal sufficient to make into a ball with boiling water.

One should be given every morning for a week, then a dose of physic; linseed oil being the most proper. Let the stomach rest a week; give another course of balls and dose of physic, after which let the horse have a drachm of sulphate of iron (powdered) twice a day with his feed of corn.

There is no medicine which is so effectual for removing worms in the horse as tartar emetic, and none which is so entirely innocuous to the stomach. Calomel and spirit of turpentine were formerly in use as vermifuges, but they are both dangerous drugs; the former, if given for any length of time, causing great derangement of the stomach and liver; and the latter often producing considerable inflammation after a single dose, if sufficiently large to cause the expulsion of the worms. Linseed oil given in half-pint doses every morning is also an excellent vermifuge, but not equal to the tartar emetic. If this quantity does not relax the bowels it may be increased until they are rendered slightly more loose than usual, but avoiding anything like purgation.

The smaller species of intestinal worm chiefly inhabits the rectum, but is occasionally found in the colon and cæcum. It produces great irritation and uneasiness, but has not the same prejudicial effect on the health as the larger parasite. It is about one to two inches in length, and somewhat smaller in diameter than a crow quill. These worms are commonly distinguished as *ascarides*, but both this species and the round worm belong to the genus *ascaris*. The term *thread worm* is more correctly applied, as they are not unlike sections of stout thread or cotton. The only *symptom* by which their presence can be made out is the rubbing of the tail, when if, on examination, no vermin or eruption is found in the dock, it may be presumed that worms exist in the rectum. The *remedy* for these worms is by the injection every morning for a week of a pint of linseed oil, containing two drachms of spirit of turpentine. This will either kill or bring away the worms, with the exception of a few which are driven by it higher up into the

colon, but by waiting a week or ten days (during which time they will have re-entered the rectum) and then repeating the process, they may generally be entirely expelled. The sulphate of iron must be given here, as before described.

DISEASES OF THE LIVER.

THE LIVER OF THE HORSE is less liable to disease than that of any other domestic animal, and the symptoms of its occurrence are so obscure that it is seldom until a post-mortem examination that a discovery is made of its existence. This unerring guide, however, informs us that the liver is sometimes unnaturally enlarged and hard, at others softened, and in others again the subject of cancerous deposits. It is also attacked by inflammation, of which the *symptoms* are feverishness; rapid pulse, not hard and generally fuller than usual; appetite bad; restlessness, and the patient often looking round to his right side with an anxious expression, not indicative of severe pain. Slight tenderness of the right side; but this not easily made out satisfactorily. Bowels generally confined, but there is sometimes diarrhœa. Very frequently the whites of the eyes show a tinge of yellow, but anything like jaundice is unknown. The *treatment* must consist in the use of calomel and opium, with mild purging, thus:—

Take of Calomel,

Powdered Opium, of each one drachm.

Linseed Meal and boiling water enough to make into a ball, which should be given night and morning. Every other day a pint of Linseed Oil should be administered.

The *diet* should if possible be confined to green food, which will do more good than medicine; indeed, in fine weather, a run at grass during the day should be preferred to all other remedies, taking care to shelter the horse at night in an airy loose-box.

DISEASES OF THE KIDNEYS.

THESE ORGANS are particularly prone to disease, and are subject to inflammation; to diabetes, or profuse staling; to hæmaturia, or a discharge of blood, and to torpidity, or inaction.

INFLAMMATION OF THE KIDNEYS (*nephritis*) is generally produced by an exposure of the loins to wet and cold, as in carriage-horses standing about in the rain during the winter season. Sometimes it follows violent muscular exertion, and is then said to be caused by a strain in the back, but in these cases there is probably an exposure to cold in a state of exhaustion, or by the rupture of a branch of the renal artery or vein, as the inflammation of one organ can scarcely be produced by the strain of another. The *symptoms* are a constant desire to void the urine, which is of a very dark color—often almost black. Great pain, as evidenced by

the expression of countenance and by groans, as well as by frequent wistful looks at the loins. On pressing these parts there is some tenderness, but not excessive, as in rheumatism. The pulse is quick, hard, and full. The attitude of the hind quarters is peculiar, the horse standing in a straddling position with his back arched, and refusing to move without absolute compulsion. It is sometimes difficult to distinguish nephritis from inflammation of the neck of the bladder, but by attending to the state of the urine, which is dark brown or black in the former case, and nearly of a natural color in the latter, the one may be diagnosed from the other. To make matters still more clear, the oiled hand may be passed into the rectum, when in nephritis the bladder will be found contracted and empty (the urine being so pungent as to irritate that organ), while in inflammation or spasm of its neck, it will be distended, often to a large size. The *treatment* to be adopted must be active, as the disease runs a very rapid course, and speedily ends in death if neglected. A large quantity of blood must at once be taken. The skin must be acted on energetically, so as to draw the blood to its surface, and if a Turkish bath (see page 215) is at hand, it will be highly beneficial. If not, the application of hot water, as recommended at page 342, may be tried, and in many cases it has acted like a charm. Failing the means for carrying out either of these remedies, the loins should be rubbed with an embrocation consisting of olive oil, liquid ammoniæ and laudanum in equal parts, but cantharides and turpentine must be carefully avoided, as likely to be absorbed, when they would add fuel to the fire. A fresh sheepskin should be warmed with hot (not boiling) water, and applied over the back, and the liniment should be rubbed in profusely every hour, restoring the skin to its place immediately afterwards. Mustard is sometimes used instead of ammonia, and as it is always at hand, it may form a good substitute, but it is not nearly so powerful an irritant to the skin as the latter, especially when evaporation is prevented by the sheepskin, or by a piece of any waterproof article. A mild aperient may be given, linseed oil being the best form, but if the bowels continue obstinate, and it is necessary to repeat it, eight or ten drops of croton oil may be added to a pint of the oil, great care being taken to assist its action by raking and injection, the latter being also useful as a fomentation to the kidneys. The *diet* should consist of scalded linseed and bran mash, no water being allowed without containing sufficient linseed tea to make it slightly glutinous, but not so much so as to nauseate the patient. If the symptoms are not greatly abated in six or eight hours, the bleeding must be repeated, for upon this remedy the chief dependence must be placed. A mild and soothing drench, composed of half an ounce of carbonate of soda, dissolved in six ounces of linseed tea, may be given

every six hours, but little reliance can be placed upon it. The inflammation either abates after the bleeding, or the horse dies in a very few hours.

DIABETES of late years has been much more frequent than was formerly the case, and especially among race-horses and hunters, probably owing to the enormous quantities of corn which they are allowed in the present day. But whatever may be the cause, the *symptoms* are clear enough, the horse constantly staling and passing large quantities of urine each time. *The treatment* should be conducted on the principle that the cause should if possible be ascertained and removed. Mowburnt hay will often bring on diabetes, and new oats have a similar tendency in delicate horses. In any case it is wise to make a total change in the food as far as it can possibly be done. Green meat will often check it at once, and a bran-mash containing a few carrots has a similar chance of doing good. With these alterations in the *quality* of the food attention should also be paid to the *quantity* of the corn, which should be reduced if more than a peck a day has been given, and beans should be substituted for a part of the oats. Half a drachm of the sulphate of iron (powdered) should be mixed with each feed (that is, four times a day), and the horse should be well clothed and his legs warmly bandaged in a cool and airy (but not cold and draughty) loose box. By attention to these directions the attack may generally be subdued in a few days, but there is always a great tendency to its return. Should it persist in spite of the adoption of the measures already recommended, the following ball may be tried:—

Take of Gallic Acid $\frac{1}{2}$ drachm.

Opium 1 drachm.

Treacle and Linseed Meal enough to make into a ball, which should be given twice a day.

HÆMATUREA, like diabetes, is easily recognised by the presence of blood in greater or less quantities passed with the urine. It is not, however, of the bright red color natural to pure blood, but it is more or less dingy, and sometimes of a smoky-brown color, as occurs in inflammation. Bloody urine, however, may often be passed without any sign of that condition, and therefore unaccompanied by pain, or any other urgent symptom. The causes are exceedingly various. Sometimes a parasitic worm (*Strongylus gigas*) has been discovered, after death from hæmatærea, in the kidney, and was apparently the cause of the mischief. At others, this organ has been found disorganized by cancer or melanosis—and again a sharp calculus has been known to bring on considerable bleeding, and this last cause is by no means unfrequent. The *symptoms* are the existence of bloody urine unaccompanied by pain or irritation, marking the absence of nephritis. As to *treatment*, little can be done in severe cases, and mild ones only require rest,

a dose of physic, and perhaps the abstraction of three or four quarts of blood. Green food should be given, and the diet should be attended to as for diabetes. If the urine is scanty, yet evidently there is no inflammation, two or three drachms of nitre may be given with the mash at night, but this remedy should be employed with great caution.

INACTION OF THE KIDNEYS is so common in every stable that the groom seldom thinks it necessary even to inform his master of its occurrence. An ounce of nitre is mixed and given with a bran-mash as a matter of course, and sometimes more violent diuretics are resorted to, such as powdered resin and turpentine. Very often the kidneys are only inactive because the horse has not been regularly watered, and in those stables where an unlimited supply is allowed this condition is comparatively rare. There is no harm in resorting to nitre occasionally, but if it is often found necessary to employ this drug, the health is sure to suffer, and an alteration in the diet should be tried in preference. At all events, if it is given, the horse should be allowed to drink as much and as often as he likes, without which the stimulus to the kidneys will be doubly prejudicial, from being in too concentrated a form.

DISEASES OF THE BLADDER.

THE BLADDER is subject to inflammation of its coats or neck—to spasm—and to the formation of calculi.

INFLAMMATION OF THE BLADDER (cystitis) is not very common excepting when it is produced by irritants of a mechanical or chemical nature. Thus, when the kidneys secrete a highly irritating urine, the bladder suffers in its passage, and we have the two organs inflamed at the same time. Again, when cantharides have been given with a view to stimulate exhausted nature, or when they are absorbed from the surface of the skin, as sometimes happens in blistering, the bladder is liable to become inflamed. The *symptoms* are—a quick pulse—pain in the hind quarter, evinced by the looks of the animal in that direction—and constant straining to pass the urine, which is thick and mixed with mucus, or in aggravated cases with purulent matter. The *treatment* to be adopted if the case is severe will consist in venesection, back-raking, and purgation with linseed or castor oil, avoiding aloes, which have a tendency to irritate the bladder. Linseed tea should be given as the sole drink, and scalded linseed mixed with a bran-mash as food. The following ball may also be given, and repeated if necessary:—

Take of Powdered Opium	1 drachm.
Tartar emetic	1½ drachm.

To be made up into a ball with Linseed Meal and boiling water, and given every six hours.

RETENTION OF URINE may be due either to inflammation of the neck of the bladder, occasioning a spasmodic closure of that part, or there may be spasm unattended by inflammation and solely due to the irritation of some offending substance, such as a calculus, or a small dose of cantharides. The *treatment* in either case must be directed to the spasmodic constriction, which is generally under the control of large doses of opium and camphor, that is, from one drachm to two drachms of each, repeated every five or six hours. If the symptoms are urgent, bleeding may also be resorted to, and when the bladder is felt to be greatly distended, no time should be lost in evacuating it by means of the catheter, which operation, however, should only be intrusted to a regular practitioner accustomed to its use.

CALCULI IN THE BLADDER are formed of several earthy salts, and present various forms and appearances, which may be comprised under four divisions. 1st. The mulberry calculus, so named from its resemblance to a mulberry, possessing generally a nucleus. 2d. A very soft kind resembling fuller's earth in appearance, and being chiefly composed of phosphate of lime and mucus. 3d. Calculi of a white or yellowish color, rough externally and easily friable. And 4th. Those which are composed of regular layers, and which are harder than the second and third varieties.

The mulberry calculus, from its extremely rough surface, occasions more irritation than other forms, but during life it is impossible to ascertain the exact chemical nature of the calculus which may be ascertained to exist. These calculi sometimes attain an immense size, weighing several pounds. The *symptoms* are a difficulty of voiding the urine, which generally comes away in jerks after great straining and groaning. The horse remains with his legs extended for some time afterwards, and evidently indicates that he feels as if his bladder was not relieved. Often there is muco-purulent matter mixed with the urine, which is rendered thick and glutinous thereby, but this only happens in cases of long standing. The *treatment* must be either palliative or curative. If the former, it should consist in the adoption of the means employed for subduing irritation and inflammation of the bladder which have been already described. The *cure* can only be effected by removing the stone. This requires the performance of a difficult and dangerous operation (lithotomy), the details of which can be only useful to the professed veterinary surgeon, and I shall therefore omit them here.

DISEASES OF THE ORGANS OF GENERATION.

BALANITIS, or inflammation of the glans penis (*βάλανος*, glans), is very common in the horse, being brought on by the decomposition of the natural secretions, when they have been allowed to

collect for any length of time. At first there is merely a slight discharge of pus, but in process of time foul sores break out, and very often fungous growths spring from them, which block up the passage through the opening of the sheath, and cause considerable swelling and inconvenience. These are quite distinct from warts, which occur in this part just as they do in other situations. The *treatment* requires some skill and experience, because mild remedies are of no use, and severe ones are not unattended with danger. The parts must first of all be well cleansed by syringing, or if the end of the penis can be laid hold of, by washing with a sponge. The following wash may then be applied, and it should be repeated every day:—

Take of solution of Chloride of Zinc 2 drachms.
Water 1 pint. Mix.

If the morbid growths are very extensive, nothing but amputation of the penis or the use of corrosive sublimate will remove them. Severe hæmorrhage sometimes follows both of these measures, but it seldom goes on to a dangerous extent. Still it is scarcely advisable for any one but a professional man to undertake the operation.

IN THE MARE THE VAGINA is sometimes inflamed, attended with a copious yellow discharge. An injection of the wash mentioned in the last paragraph will generally soon set the matter right. At first it should be used only of half the strength, gradually increasing it, until the full quantity of chloride of zinc is employed.

INVERSION OF THE UTERUS sometimes follows parturition, but it is very rare in the mare. The uterus should be at once replaced, using as little force as possible, and taking care before the hand is withdrawn, that it really is turned back again from its inverted position.

NYMPHOMANIA occurs sometimes in mares at the time of being "in use," and goes on to such an extent as to render them absolutely regardless of pain, for the time being, though not to make them lose their consciousness. They will kick and squeal till they become white with sweat, and no restraint will prevent them from trying to continue their violent attempts to destroy everything behind them. These symptoms are especially developed in the presence of other animals of the same species, whether mares or geldings; but the near proximity of an entire horse will be still worse. If placed in a loose box, without any restraint whatever, they generally become more calm, and when the state is developed, such a plan should always be adopted. It is chiefly among highly-fed and lightly-worked mares that the disease is manifested; and a dose of physic with starvation in a loose box, away from any other horse, will very soon put an end to it in almost every instance.

CHAPTER V.

DISEASES OF THE NERVOUS SYSTEM.

Phrenitis, or Mad Staggers—Epilepsy and Convulsions—Megrims—Rabies, Hydrophobia, or Madness—Tetanus, or Lock-jaw—Apoplexy and Paralysis—String Halt—Coup de Soleil, or Sun stroke.

PHRENITIS, OR MAD STAGGERS.

PHRENITIS seldom occurs, except in over-fed and lightly-worked horses, nor among them is it by any means a common disease. The early *symptoms* are generally those of an ordinary cold; there is heaviness of the eyes, with a redness of the conjunctiva, and want of appetite. After a day or two occupied by these premonitory signs, which will seldom serve to put even the most experienced observer on his guard, the horse becomes suddenly delirious, attempting to bite and strike every one who comes near him, regardless of the ordinary influences of love and fear. He plunges in his stall, attempts to get free from his halter rein, and very often succeeds in doing so, when he will stop at nothing to gain still further liberty. If unchecked he soon dashes himself to pieces, and death puts an end to his struggles. The only *treatment* which is of the slightest use is bleeding till the horse absolutely falls, or till he becomes quite quiet and tractable, if the case is only a mild one. Immediately afterwards a large dose of tartar emetic (two or three drachms) should be given, followed in an hour or two by a strong physic ball; or, if the case is a very bad one, by a drench, containing half a pint of castor oil and six or eight drops of croton oil. Clysters and back-raking will of course be required, to obviate the risk of hard accumulations in the bowels, but where there is great violence, they cannot always be employed and the case must take its chance in these respects. The *diet* should be confined to a few mouthfuls of hay or grass, with a plentiful supply of water.

EPILEPSY AND CONVULSIONS.

THESE DISEASES, or symptoms of disease, are not often met with in the adult, but in the foal they sometimes occur, and are not unattended with danger. The young thing will perhaps gallop after its dam round and round its paddock, and then all at once stop,

stagger, and fall to the ground, where it lies, struggling with more or less violence, for a few minutes or longer, and then raises its head, stares about it, gets up, and is apparently as well as ever. It is generally in the hot days of summer that these attacks occur, and it appears highly probable that the direct rays of the sun playing on the head have something to do with it. Death seldom takes place during the first attack, but sometimes after two or three repetitions the convulsions go on increasing, and the foal becomes comatose and dies. A mild dose of linseed oil is the only *remedy* which can safely be resorted to, and as it is supposed that worms will sometimes produce these convulsive attacks, it is on that account to be selected. Epilepsy is so very rarely met with in the adult and of its causes and treatment so little is known, that I shall not trouble my readers with any account of them.

MEGRIMS.

THIS TERM is used to conceal our ignorance of the exact nature of several disordered conditions of the brain and heart. In fact, any kind of fit, not attended with convulsions, and only lasting a short time, is called by this name. The cause may be a fatty condition of the heart, by which sudden faintness and sometimes death are produced, or it may consist in congestion of the vessels of the brain, arising from over work on a hot day, or from the pressure of the collar, or from disease of the valves of the heart. Attacks reputed to be megrims have been traced to each of these causes, and as in every case, the horse, while apparently in good health, staggers and falls, and after lying still for a minutes (during which there is seldom an opportunity of examining the state of the circulation) rises as well as before, there is no chance of distinguishing the one from the other. The most usual *symptoms* are the following:—The horse is perhaps trotting along, when all at once he begins shaking his head as if the bridle chafed his ears, which are drawn back close to the poll. The driver gets down to examine these facts, and observes the eyelids quivering, and the nostrils affected with a trembling kind of spasm. Sometimes the rest will allow of the attack going off, but most frequently, the head is drawn to one side, the legs of that half of the body seem to be paralyzed, and the horse making a segment of a circle goes down, lies a few minutes on the ground, and then rises as if nothing had happened beyond a light sweating, and disturbance of the respiration. *Treatment* can be of little avail, however, unless a correct diagnosis is made, for remedies which would be suited to congestion would be prejudicial to a diseased heart. If the attack has happened while

n harness, the collar should always be carefully inspected, and if at all tight it should be replaced by a deeper one. A diseased state of the valves of the heart ought to be discoverable by auscultation, but it requires a practised ear to do this, and the directions for ascertaining its presence are beyond the scope of this book. The only plan which can safely be adopted, is to take the subject of megrims quietly home to his stable, and carefully examine into the condition of all his functions with a view to improve the action of any organ which appears to be out of order, whatever it may be. If all seems to be going on well—if the appetite is good, and the heart acts with regularity and with due force, while the brain seems clear, and the eye is not either dull or suffused with blood—nothing should be attempted, but the horse being subject to a second attack, as proved by manifold experience, should be put to work in which no great danger can be apprehended from them. He is not safe in any kind of carriage, for it can never be known where the fall will take place; and as a saddle-horse he is still more objectionable, and should therefore be put to some commercial purpose, in executing which, if he falls, the only injury he can effect is to property, and not to human life.

RABIES, HYDROPHOBIA OR MADNESS.

ONE REASON ONLY can be given for describing this disease, which is wholly beyond the reach of art; but as the horse attacked by it is most dangerous, the sooner he is destroyed the better; and for this reason, every person who is likely to have any control over him, should be aware of the symptoms. As far as is known at present, Rabies is not idiopathically developed in the horse, but must follow the bite of a rabid individual belonging to one or other of the genera *canis* and *felis*. The dog, being constantly about our stables, is the usual cause of the development of the disease, and it may supervene upon the absorption of the salivary virus without any malicious bite, as has happened according to more than one carefully recorded case. The lips of the horse are liable to be ulcerated from the action of the bit, and there is reason to believe that in the early stages of rabies these parts have been licked by a dog, the saliva has been absorbed, and the inoculation has taken place just as it would do from any other wound. It is difficult to prove that this is the true explanation of those cases where no bite has been known to have occurred, but as the mouth has in each instance been shown to have been abraded, there is some reason for accepting it as such. To proceed, however, to the *symptoms*, Mr. Youatt, who has had great opportunities for examining rabies, both in the dog and horse, describes the earliest as consisting in “a spasmodic movement of the upper lip, particularly of the angles of the lip. Close following on this, or contemporaneous with it,

are the depressed and anxious countenance, and inquiring gaze, suddenly, however, lighted up, and becoming fierce and menacing from some unknown cause, or at the approach of a stranger. From time to time different parts of the frame, the eyes, the jaws, particular limbs, will be convulsed. The eye will occasionally wander after some imaginary object, and the horse will snap again and again at that which has no real existence. Then will come the irrepressible desire to bite the attendants or the animals within its reach. To this will succeed the demolition of the rack, the manger, and the whole furniture of the stable, accompanied by the peculiar dread of water, which has already been described. Towards the close of the disease there is generally paralysis, usually confined to the loins and the hinder extremities, or involving those organs which derive their nervous influence from this portion of the spinal cord; hence the distressing tenesmus which is occasionally seen." How paralysis can produce tenesmus is not very clear, but of the very general existence of this symptom there can be no doubt. The dread of water, as well as of draughts of cold air, is also clearly made out to exist in this disease (as in human rabies), and the term hydrophobia will serve to distinguish it better than in the dog, where it is as clearly absent. Whenever, therefore, these symptoms follow upon the bite of a dog, unless the latter is unquestionably in good health, rabies may be suspected, and the bare suspicion ought always to lead to the use of the bullet, which is the safest way of killing a violent horse. There is only one disease (*phrenitis*) with which it can be confounded, and in that the absence of all consciousness and, in milder cases, of fear, so that no moral control whatever can be exercised, marks its nature, and clearly distinguishes it from rabies, the victim to which is conscious to the last, and though savage and violent in the extreme, is aware of the power of man, and to some extent under his influence.

TETANUS—LOCK-JAW.

TETANUS, one form of which is known as lock-jaw, has its seat apparently in the nervous system, but, like many other diseases of the same class, the traces it leaves behind are extremely uncertain, and are displayed more on the secondary organs, through which it is manifested, than on those which we believe to be at the root of the mischief. Thus the muscles, which have been long kept in a state of spasm, show the marks of this condition in their softened and apparently rotten condition. They in fact have had no interval of rest, during which nutrition could go on, and have lost much of the peculiarity of structure which enables them to contract. The stomach often shows marks of inflammation, but as all sorts of violent remedies are employed, this may be due to them rather than to idiopathic disease. The lungs also are generally congested.

but here, like the state of the muscles, it may be a secondary effect of the long-continued exertions of the latter, which nothing but the absence of all important lesions of the brain and spinal cord would induce the pathologist to pay the slightest attention to.

TETANUS may be either idiopathic or symptomatic, but the former condition is somewhat rare. It almost always follows some operation, or a severe injury in which a nerve has been implicated, the most frequent causes being the piercing of the sole by a nail, or a prick in shoeing, or the operations of docking, nicking, castration, &c.

THE SYMPTOMS are a permanent rigidity of certain voluntary muscles, and especially of the lower jaw (whence the popular name, lock-jaw). The mouth is kept rigidly shut, the masseter muscles feeling as hard as a deal board. One or both sides of the neck are rigid, in the former case the head being turned to one side, and in the latter stretched out as if carved in marble. The nostrils are dilated; the eyes retracted, with the haws thrust forward over them; the ears erect and stiff, and the countenance as if horror-struck. At first the extremities are seldom involved, but as the disease progresses their control is first lost, and then they become rigid, like the neck and head. The patient is scarcely able to stand, and plants his feet widely apart to prop himself up, while at last the tail also becomes a fixture. The pulse varies a good deal, in some cases being quick, small, and hard, and in others slow and labored. The bowels are generally costive, and the urine scanty; but this last symptom is not so well marked as the state of the bowels alluded to. The *treatment* should be of a two-fold nature, partly palliative and partly curative. Since the introduction into use of chloroform we have possessed a drug which invariably enables us to remove the spasm for a time, and if it does nothing more, it gives room for other remedies to act and relieve the patient from the horrible tortures which are occasioned by the spasm, while it also allows the muscular and nervous powers to be recruited. When, therefore, a case of tetanus occurs in a horse of any value, an apparatus for applying chloroform (described under the chapter on Operations) should be procured, and the animal at once placed under its influence. This done, the whole length of the spine should be blistered with tincture of cantharides, and an active aperient should be given, consisting, if practicable, of a pint of castor oil, and six or eight drops of croton oil. This may be pumped down the throat by the usual syringe and tube, if the front teeth can be separated; but if this cannot be done, some solid cathartic must be selected, though there is often as much difficulty in forcing a ball down as in passing an elastic tube. Failing in either of these, two drachms of calomel, and the same quantity of tartar emetic should be slightly damped, and placed in

the mouth as far back as possible, in the hope that they may be gradually swallowed; the bowels should be raked, and copious injections of castor oil and turpentine, mixed with several quarts of gruel, should be thrown up. If these remedies fail, nature must be left to her own resources, and they will sometimes be found equal to the task, for many cases have recovered after having been given up as beyond the reach of our art. Opium, hellebore, digitalis, hellebore, and a host of other drugs have been tried, sometimes with, and sometimes without success, and perhaps it is worth while, after the bowels have been well relieved, to give a full dose of one or other of these powerful remedies, such as two drachms of solid opium; but I confess that I think little reliance is to be placed on them, and I prefer the adoption of chloroform every six hours, continued for about two or three hours and gradually withdrawn, leaving the cure to the action of the blister and purgatives.

APOPLEXY AND PARALYSIS.

USUALLY these are only different degrees of the same disease, but there are exceptions in which the latter is produced by some chronic affection of the spinal cord or brain. As a rule both depend upon pressure made on the brain by an overloaded state of the vessels, commonly known as congestion, or by extravasation of blood, in which it escapes from them.

APOPLEXY, known among writers of the old school as sleepy staggers, is not often met with in the present day, owing to the improvement in the management of our stables, and specially to their better ventilation. It is marked by great sleepiness, from which the horse can be with difficulty roused, soon going on to absolute unconsciousness, attended by a slow snoring respiration, and speedily followed by death. The only *treatment* likely to be successful is copious bleeding, purgation, and blisters to the head and neck.

PARALYSIS is marked by a loss of power over the muscles of a part, and may be confined to one limb or organ or extend to more. It is a *symptom* of pressure on, or disorganization of, some part of the nervous system, and must be considered as such, and not as a disease of the affected muscles. Thus it requires a knowledge of anatomy to trace it to its seat, without which its treatment would be conducted on false principles. By far the most common form of paralysis is hemiplegia, or paralysis of the muscles of the hinder extremities and loins, generally arising from an injury to the spine. Sometimes the body of a vertebra is broken, and the parts being separated, their edges press upon the spinal cord and produce the disease. At others the vessels within the canal have received a

shock, and the serous membrane secretes (or allows to ooze out) a bloody fluid which presses upon the cord, and produces the same effect but in a more gradual manner. In India, a disease known there as Kumree causes paralysis of the hinder extremities, and is due to inflammation of the membranes, which secrete a bloody serum. In this country, however, paraplegia is very rare excepting as the result of accident.

WHEN A HORSE FALLS in hunting, and never moves his hind legs afterwards, but lies with his fore legs in the position to get up, groaning and expressing great pain and distress, it may be concluded that he has fractured or dislocated his spine and that the case is hopeless. Sometimes, however, after lying for a few seconds, he slowly and with difficulty rises and is led to a stable, but after two or three hours lies down and cannot be got up again. Here there will be some difficulty in ascertaining whether the mischief is confined to a strain of the muscles or is situated within the vertebral canal. If the former is the case the pain is extreme, and generally there will be some quivering or slight spasm of one or more of the muscles of the hinder extremity, which feel naturally firm, while in paralysis they feel soft and are as quiet as they would be after death. By attention to these signs the two cases may be distinguished, but when the case is made out to be true paralysis the *treatment* is not likely (even if successful in preserving life) to bring about a useful restoration to healthy action. In valuable horses an attempt may be made by bleeding, physicking and blistering, to produce an absorption of the effused serum or blood, but the recovered animal is seldom worth the outlay, and too often as soon as he is put to any kind of work is subject to a relapse. The most humane and certainly the most economical plan is to put him out of his misery at once by a pistol ball or knife, but if it is determined to try what can be done towards effecting a cure, no better means can be adopted than those I have alluded to.

STRING HALT.

THIS IS A PECULIAR SNATCHING UP of the hind leg, and is supposed to depend upon some obscure disease of the sciatic nerve. It however is very doubtful whether this explanation is well founded, and there is evidence that in some cases the hock itself has been affected. The extensor pedis seems to be the muscle most severely implicated, though not the only one which is thrown into spasmodic action. No *treatment* is of the slightest avail. Horses with string halt are able to do any kind of work, but it is considered to be a form of unsoundness.

[SUNSTROKE—COUP DE SOLEIL.

THIS DISEASE of late years has become of so frequent occurrence, that although not mentioned by previous veterinary writers, it demands a notice from us. The chief symptoms are exhaustion and stupidity, the animal usually falling to the ground and being unable to go further.

TO PREVENT IT, allow the horse at short intervals a few mouthfuls of water, and fasten a wet sponge over the forehead. The sun-shades now used by extensive owners of horses, will go very far in lessening the occurrence of this affection.

The following *treatment*, when attended to at once, in the majority of cases will prove effectual.

First. Remove the horse from the harness to a cool shady place. *Second.* Give two ounces of sulphuric ether ; 20 drops of the tincture of aconite root and a bottle of ale or porter as a drench to sustain the vital powers, and to act as a powerful stimulant in equalizing the circulation throughout the body ; whilst, *Thirdly.* Chopped ice is to be placed in a coarse towel, cloth or bag, and laid between the ears and over the forehead, secured in any way the ingenuity of the person in charge may suggest. If the legs be cold, bandages will be of advantage. Do not put the horse to work again until he is completely restored. Dumbness is the usual result of sun-stroke—a species of coma—for which there is no cure. Horses so affected are of little use in warm weather but are useful in winter.

CHAPTER VI.

DISEASES AND INJURIES OF CERTAIN SPECIAL ORGANS.

Diseases of the Ear—Inflammation of the Eye—Cataract—Amaurosis—Buck-eye—Surfeit—Hidebound—Mange—Lice—Malenders and Sallenders—Warbles, Sitfasts and Harness-Galls—Grubs—Bites and Stings of Insects—Swelled Legs—Chapped Heels—Grease and Scratches—Warts—Corns—Sandcrack—False Quarter—Quittor—Thrush—Canker—Laminitis—Seedy Toe—Contraction of the Foot—Navicular Disease—Accidents to the Legs and Feet.

DISEASES OF THE EAR.

DEAFNESS is sometimes met with in the horse, but I know of no symptoms by which its precise nature can be made out; and without ascertaining the seat of the disease, it is useless to attempt to treat it.

SOMETIMES FROM A BLOW on the external ear inflammation is set up, and an abscess forms; but all that is necessary is to open it, so that the matter can readily flow out as fast as it forms, without which precaution it will not readily heal.

INFLAMMATION OF THE EYE.

THIS IMPORTANT ORGAN is subject to three forms of inflammation, to opacity of the lens, and to paralysis of the nerve, called amaurosis.

SIMPLE INFLAMMATION is the most common of all the diseases to which the horse's eye is subject, and it precedes most of the others. It is always the result of any injury of this part, or of cold; and it shows itself if there is a tendency to inflammation of this organ, whenever the horse is in a state of plethora. The *symptoms* are an intolerance of light, so that the eye is kept half closed, by which it looks smaller than the other; a gummy secretion glues the lids together at the angles; the eyelids are slightly swollen, showing a distended state of their veins; and there is more or less watering or overflowing of tears. When the lids are separated, their internal surface looks more red than natural, and the white of the eye is covered with a net-work of fine red vessels. After the second day the transparent cornea loses its clearness, and becomes muddy, sometimes over the whole surface, and at others in specks. If the disease is allowed to go on unchecked, the cornea is involved, and the lining membrane of the aqueous humor follows; a secretion of pus takes place into the chamber, or the cornea ulcerates, and the contents of the eye escape. The

treatment should be a copious bleeding from the jugular vein, followed by a ball, such as—

Take of Common Physic Ball	2 drachms.
Tartar Emetic	1 drachm.

Mix and give every six hours.

This not only acts on the intestines, but it keeps up a constant nausea, and so tends to lower the action of the heart. The eye should be bathed with warm water frequently; and, if the mischief be severe, a seton should at once be put into the skin covering the upper jaw, about two inches below the eye. On the next day, if "the white" still looks red, the bleeding must be repeated; and, if the bowels are much moved, the tartar emetic may be continued without the aloes, while if they are obstinate, the dose of the latter may be increased. When the acute symptoms have somewhat diminished, a camel's-hair brush may be dipped in wine of opium, and the eye gently touched with it daily, which will generally complete the cure. The *diet* must be low, corn being forbidden entirely, and the stable should be kept very cool and airy.

PURULENT OPHTHALMIA is confined to the conjunctiva, and it may be recognised by the profuse discharge of purulent fluid which takes place. The eyelids are much swollen, and the white of the eye is covered with a puffy red membrane, which rises up above the level of the cornea, sometimes in fungoid excrescences. This form of inflammation is generally epidemic, and sometimes runs through a stable without a single exception. The *treatment* should be, at first, similar to that recommended for simple inflammation; but when it reaches the chronic stage, a more powerful stimulus is required to restore the vessels to a healthy condition. A wash composed as follows, must therefore be applied:—

Take of Nitrate of Silver	6 grs.
Distilled Water	1 oz.

Mix, and drop a little into the eye from a quill daily.

IRITIS, or inflammation of the iris, generally known as *specific ophthalmia*, is the most formidable of all the diseases to which the eye is subject, and, if not checked, rapidly disorganizes it; while it also, even when running an unusually favorable course, is very apt to produce opacity of the lens or its capsule (cataract). This pest of the stable is, undoubtedly, often brought on by over stimulation, first of the whole body, through the food, and secondly, of the eyes themselves, through the foul emanations from the accu-

mulated urine and dung. But these would produce no such effect in a horse, unless he were predisposed to ophthalmia; and we find that cattle and sheep are often fed to an enormous degree of obesity, in far closer and worse ventilated stalls, without any prejudicial effect upon their eyes. It may, then, be assumed, that these organs in a horse have a tendency to put on inflammation; but though these words are true they explain nothing of the real cause, and only serve to conceal our ignorance of it. There is another question bearing upon this subject, which is of the highest importance. Is the stock of blind horses more liable to blindness than that of sound ones? This has been discussed so often, that it is scarcely possible to throw any fresh light upon it, chiefly because it is so difficult to rely upon the facts adduced *pro* and *con*. Blindness is often the result of accident, and such cases are believed to be exceptional, and not at all likely to hand down the disease; but, on the contrary, I am inclined to believe that many of them show a marked tendency to its development; for an accident never destroys both eyes, and when one follows the other, it is a pretty sure sign that there is a tendency to ophthalmia. On the whole, it may, I think, be assumed, that the tendency to specific ophthalmia is handed down from generation to generation, and, consequently, that the offspring of a horse who has gone blind from that cause is peculiarly prone to it. Its *symptoms* appear very rapidly, the eye having been quite right over night, looks contracted and almost closed next morning, and on inspecting it closely "the white" looks of a deep red, the cornea looks muddy, and the colored part of the eye (the iris) has lost its bright color, and often shows one or two white specks upon it (these must not be confounded with specks on the cornea). As the disease advances, the intolerance of light is very great, the cornea and iris become gradually more muddy, and either lymph is thrown out on the latter in the shape of white patches, or pus is secreted and fills the chamber of the aqueous humor, in part or wholly. If the *treatment* is sufficiently energetic, these signs abate, the pus or lymph is absorbed, and the eye recovers its transparency; but there are generally some traces left behind. Bleeding (either from the jugular or the angular veins of the face), moderate purging, and a seton, are the remedies best calculated to effect this object, conjoined with an airy stable and a light diet. Unfortunately, however, iritis is almost sure to return on the restoration of the usual food, and exposure to the elements; and hence it is of the utmost consequence in purchasing a horse to examine his eyes for the marks left behind by it. If the case is hopeless, it becomes a question whether or not it will be wise to put an end to the inflammation by destroying the affected eye, for it is well known that if it goes on for any length of time the other, sound eye, becomes affected. The only difficulty consists in feel-

ing assured that there is really no chance of recovery; for when once the eye is finally condemned, the sooner it is opened and its contents evacuated, the sooner will the horse return to his work, and the more chance has the other eye of escaping. The operation is very simple, and merely requires a sharp-pointed knife to be passed into the anterior chamber from one edge of the cornea, and driven back till it cuts into the lens, when it is to be brought out on the other side of the cornea, and the whole of the humors will escape on making pressure upon the upper eyelid.

IN INJURIES of the eye, fomentation with warm water should be carried on for half an hour, and then omitted for three or four hours; after which it may be repeated again and again, at similar intervals. Great care should be taken to remove any extraneous bodies, such as particles of dust, &c.

CATARACT, or opacity of the lens, is very commonly the result of iritis, its capsule having been coated with a layer of white lymph, deposited by the inflamed vessels; but it also sometimes makes its appearance without being preceded by any of the signs of inflammation. In the former case, the early symptoms are those of iritis; but in the latter, the opacity often goes on increasing, without the owner of the horse, or his groom, having his attention drawn to the eyes, until he finds that he is nearly blind. This progress is generally marked by the development of an unusual timidity; the previously-bold animal is alarmed at objects advancing on the road, and covered carts and wagons, of which he formerly took no notice, occasion him to shy in the most timid manner. On examining his eyes carefully, instead of the beautifully clear pupil, with the reflection of tapetum lucidum shining through it, there is seen either a mass of dull white, generally more opaque in the centre, or an appearance of mottled, semi-transparent soap, or, lastly, one or two distinct white spots, not quite circular, but with irregular edges. In confirmed cataract, the white pupil can be seen at any distance; but in the very early stage, only a practised eye can detect the opacity, which, however, is so manifest to him that he wonders it is not visible to every one else. The reason of this difficulty of detecting the alteration of structure seems to be, that inexperienced examiners look at the eye in such a manner that they are confused by the reflection on it of their own faces, hiding all beneath. If, however, they will turn their heads a little more on one side, this will disappear, and they cannot fail to perceive the disease. When cataract is clearly proved to exist, all idea of *treatment* may be abandoned, as nothing but an operation can procure a removal of the opacity; and that would leave the horse in a more useless condition than before, since he could see nothing clearly, and would only be subject to continual alarms. In the human being, the operation is performed with great success, because the lens which

is sacrificed can be replaced externally by means of convex glasses, but in the horse, nothing of the kind can be done. Hence, it is useless to dream of effecting any improvement in this disease; and if both eyes are the subject of cataract, the horse is incurably blind. But supposing there is a cataract in one eye only, is the other sure to go blind, or may a reasonable hope be entertained of its remaining sound? Here the history of the disease must be examined before any opinion can be formed. If the opacity followed an accident, there is no reason for concluding that the other eye will become diseased; but if it came on idiopathically, either preceded by inflammation or otherwise, there is great risk of a repetition in the sound eye. Nevertheless, instances are common enough of one eye going blind from cataract, while the other remains sound to the end of life; and those are still more frequent in which the one sound eye continues so for six or seven years.

AMAUROSIS.

THIS IS A PALSY of the nervous expansion called the retina, produced by some disease, either functional or organic, of the optic nerve, which is generally beyond the reach of our senses, in examining it after death. The *symptoms* are a full dilatation of the pupil, so that the iris is shrunk to a thin band around it, and is so insensible to the stimulus of light, in confirmed cases, that, even when the eye is exposed to the direct rays of the sun, it does not contract. In the early stages, this insensibility is only partial; and though there is such complete blindness that the horse cannot distinguish the nature of surrounding objects, yet the pupil contracts slightly, and the inexperienced examiner might pass the eye as a sound one. The unnaturally large pupil, however, should always create suspicion; and when, on closing the lids and re-opening them in a strong light, there is little or no variation in its size, the nature of the disease is at once made apparent. The *treatment* of amaurosis must depend upon the extent to which it has gone, and its duration. If recent, bleeding and a seton in close proximity to the diseased organ will be the most likely to restore it. Sometimes the disease depends upon a disordered condition of the stomach, and then a run at grass will be the most likely means to restore both the affected organs to a sound state. Generally, however, an amaurotic eye in the horse may be considered as a hopeless case.

BUCK EYE.

A BUCK EYE is, strictly, rather a congenital malformation than a disease; but practically, in reference to the utility of the animal, it matters little. It depends upon an excess of convexity in the cornea, by which the focus of the eye is shortened too much, the image being thus rendered indistinct as it falls on the retina. No *treatment* can be of the slightest use.

SURFEIT.

AN ERUPTION of the skin, which shows itself in the form of numerous small scabs, matting the hair, and chiefly met with on the loins and quarters, is known by this name. Doubtless, it has been supposed to arise from an excess of food, causing indigestion; but it often comes on in horses which, apparently, are quite free from that disorder. The most common cause appears to be, sweating the horse when he is in a gross or plethoric condition, and then exposing him to a chill. Colts are very subject to surfeit while being broken, as are horses fresh from grass during the summer, when they are usually over-fat, and require great care in reducing this plethoric condition. The usual course of the eruption is for the scabs to dry and gradually loosen, when the hair of the part is slightly thinned by being pulled out in dressing, a fresh crop of pustules forming, and, to the casual observer, keeping up the appearance of a permanent state of the original scabs. Surfeit is not confined to gross horses, as it sometimes makes its appearance in those which are low in condition, exhibiting the same appearance to the eye; but, on examination, the secretion from the skin will be found to be thinner, and of a more purulent nature. The *treatment* must greatly depend upon the state of the general health. If the horse is very gross, it may be desirable to take a little blood away; but this will seldom be necessary, and never is desirable. Physic seems to do little immediate good; and, indeed, it is very doubtful whether any treatment is of much service, excepting such as will gradually bring the horse into working condition. The disease, in most cases, has its origin in obstruction of the sebaceous and perspiratory pores; and until these are restored to their proper functions, by gradually exercising them, little good can be done. Unfortunately, the very means which will accomplish this object are apt to increase the disease for a time; but still this must be put up with, as a matter in which no choice can be made. Regular exercise and grooming must be fully attended to, using the whip only in dressing the skin, when the eruption shows itself, and carefully avoiding the brush and currycomb. By acting on the kidneys, more good will be done than by purging physic, which seems to be of little or no service in any case but when the stomach is greatly out of order. An ounce of nitre may be given with a mash twice a week, or the following balls may be administered:—

Take of Nitre,

Sulphur, of each	3 drachms.
Sulphuret of Antimony	2 drachms.
Linseed Meal and Water enough to form two balls.	

HIDEBOUND.

THIS IS ESSENTIALLY a disorder of the skin produced by sympathy with the stomach. It rarely occurs in any horse but one sadly out of health from a deficiency either in the quantity or quality of the food. Sometimes it comes on in the latter stages of consumption or dysentery, without any previous mismanagement; but in the vast majority of cases the cause may be laid to the food. The skin of a horse in health feels supple, and on his sides it may readily be gathered up by the hand into a large fold, but in hidebound it is as if it were glued to the ribs, and were also too tight for the carcase which it invests. The name, indeed, is expressive of this state, and the disease can scarcely be mistaken when once seen, or rather felt. Coincident with this condition of the skin, there is also, generally, either a distended state of the abdomen from flatulence, or a contracted and "tucked up" appearance from diarrhœa. The *treatment* should be addressed to the digestive organs, the state of which must be carefully examined, and if possible rectified. A pint of linseed, scalded, and mixed with a bran mash every night, or scalded malt given in equal quantities with the corn; or in the spring time, vetches, clover, or lucerne, will do more than any medicine; but when there is a deficient appetite, or the bowels or stomach, or either of them, are evidently much weakened and disordered, a stomachic ball once or twice a week will do good. The remedies appropriate to these several conditions will be found under their respective heads at pages 354, and 363, 364.

MANGE.

MANGE corresponds with the itch of the human subject in being produced by a parasitic insect, which is an acarus, but of a different species to that of man, and of a much larger size, so as to be readily visible to the naked eye. It is generally produced by contact with horses previously affected with the same disease, but it appears highly probable that a poor, half-starved animal, allowed to accumulate all kinds of dirt on his skin, will develop the parasite, though how this is done is not clearly made out. The whole subject of parasites is wrapped in mystery, which modern researches appear likely to fathom, but hitherto little progress has been made except in the history of the metamorphoses of the tape-worm, from the analogy of which some idea may be formed of the probable modes of production of other parasites. When caused by contagion, as certainly happens in the vast majority of cases, the first *symptoms* noticed will be an excessive itching of the skin, which is soon followed by a bareness of the hair in patches, partly caused by constant friction. The disease usually shows itself on

the side of the neck, just at the edges of the mane, and on the insides of the quarters near the root of the tail. From these parts the eruption extends along the back and down the sides, seldom involving the extremities excepting in very confirmed cases. After a time the hair almost entirely falls off, leaving the skin at first bare and smooth, with a few small red pimples scattered over it, each of which contains an acarus, and these are connected by furrows, along which the acari have worked their way to their present habitation. In process of time the pimples increase in number and size, and from them a matter exudes which hardens into a scab, beneath which, on examination, several acari may readily be seen, moving their legs like mites in a cheese, to which they are closely allied. At first the mangy horse may keep his health, but after a time the constant irritation makes him feverish; he loses flesh, and becomes a most miserable object; but such cases of neglect are happily rare in the present day. The *treatment* must be addressed to the destruction of the life of the acarus, which, as in the human subject, is rapidly destroyed by sulphur, turpentine, arsenic, hellebore, and corrosive sublimate. Some of these drugs are, however, objectionable, from being poisonous to the horse, as well as to the parasite which preys upon him, and they are, therefore, not to be employed without great and urgent necessity, in consequence of the failure of milder remedies. The following recipes may be relied on as perfectly efficacious, the former being sufficient in mild cases, and the latter being strong enough in any.

1. Take of Common Sulphur 6 oz.
 Sperm or Train Oil 1 pint.
 Spirit of Turpentine 3 oz.

Mix and rub well into the skin with a flannel, or in preference with a painter's brush.

2. Take of Compound Sulphur Ointment . . . 8 oz.
 Train or Sperm Oil 1 pint.
 Spirit of Turpentine 3 oz.

Mix and use as above.

One or other of the above dressings should be well rubbed in every third day for at least three or four weeks in bad cases, and two in trifling ones, when the inflammation resulting from the acari and also from the application may be allowed to subside in the hope that all the parasites are killed, in which case the eruption disappears, but the hair does not always come on again as thickly as ever. All the stable fittings around the stall or box in which the horse has been standing should be thoroughly washed over with a solution of corrosive sublimate, made as follows:--

Take of Corrosive Sublimate	1 oz.
Methylated Spirit of Wine	6 oz.
Water	1 gallon.

Dissolve the sublimate in the spirit by rubbing in a mortar, then mix with the water, and use with a brush, stirring it up continually to prevent its settling.

The clothing should be destroyed, as it is scarcely possible to cleanse it completely from the parasites; but if it is determined to risk a return of the disease, it should be thoroughly washed, and when dry, saturated with spirit of turpentine.

When the health has suffered from the irritation of mange, a few tonic balls may be required, but generally the removal of the cause will be sufficient.

LICE.

IN FORMER DAYS LICE were not uncommon in the horse, but they are now comparatively rare. Still they are occasionally met with, and their presence is readily ascertained, being of a considerable size, and easily seen with the naked eye. They may be destroyed by rubbing into the roots of the hair white precipitate, in powder, taking care to avoid sweating the horse or wetting his skin for some days afterwards.

MALLENDERS AND SALLENDERS.

THESE ERUPTIONS are both of the same nature, differing only in the locality where they are displayed. The former shows itself in the flexure at the back of the knee, and the latter at the bend of the hock. The *symptoms* are shown in the appearance of a foul scurf mixed with a few thin scabs, the skin underneath being stiff and unyielding. They are generally brought on by washing the legs and leaving them undried. The *treatment* required is merely the application of the following ointment, which should be well rubbed in every night:—

Take of Cerate of Superacetate of Lead	2 oz.
Creosote	10 drops. Mix.

If the skin continues to be very hard and stiff, a little glycerine should be brushed on two or three times a week.

WARBLES, SITFASTS, AND HARNESS GALLS.

WHEN THE SADDLE HAS GALLED the skin beneath it, the in-

flammation resulting is called a "warble," and if this is neglected, so as to cause a troublesome sore, the term "sitfast" is applied. The effect produced is similar to a harness gall, and there is not the slightest necessity for inventing names to distinguish each stage of cruelty in the rider, for if attention is paid to the warble no sitfast will ever make its appearance. Prevention is better than cure, and it may almost always be effected by the adoption of the plan of always keeping the saddle on (after loosing the girths) for a quarter of an hour or twenty minutes. Sometimes, however, in spite of this precaution, the skin of the back swells, and when a heavy man has been riding for six or eight hours on a horse unaccustomed to his weight, the cuticle will perhaps peel off, bringing the hair with it. When the swelling is considerable it should be well fomented for an hour, and then bathed with a lotion composed of one drachm of tincture of arnica in half a pint of water. The saddle should never be re-applied until the skin is quite cool and free from all inflammation, even if considerable inconvenience is thereby suffered. The same treatment will also apply to harness galls. Oiling the inside of the collar will often prevent the shoulder from suffering excoriation.

GRUBS.

THE LARVA OF SOME BEETLE, but of what species I do not know, is occasionally met with in the horse, causing a small lump, about the size of a raisin, and usually on the back. This obstinately continues for months, if its nature is not understood, in spite of all ordinary applications. At last a white larva or grub, with a black head, and very similar in everything but size to the maggot found in the nut, makes its appearance, and either escapes to fall on the ground and become a chrysalis, or else it is squeezed out by the groom, which is easily done as soon as the head is visible. When discovered previously, an opening may be made with the point of a penknife, and then the larva may be gradually squeezed out, avoiding too much haste in the operation, which will only retard the process.

BITES AND STINGS OF INSECTS.

HORSES ARE LIABLE TO BE STUNG by hornets, wasps, and bees. If there are only one or two stings made, no interference is necessary; but sometimes a larger number of poisonous punctures have been effected, and then the best *treatment* is the application of spirit of turpentine and laudanum in equal proportions.

THE BITES OF THE GADFLY are so troublesome in their effects that it is sometimes desirable to prevent them if possible. This is effected by making a strong infusion of the green bark of the elder, and washing the flanks, &c., with it before going out.

SWELLED LEGS.

THE SKIN OF THE LEGS AND THE CELLULAR MEMBRANE beneath it are liable to two kinds of swelling, one of which is of an inflammatory character, while the other is solely due to a deposit of serum (*œdema*), owing to the non-performance of their office by the kidneys. Both kinds are much more frequent in the hind legs than the fore, but especially the former.

INFLAMMATORY SWELLED LEG, sometimes called *weed*, is generally accompanied by a certain amount of feverishness, and comes on suddenly, almost always showing itself on the inside of the hind leg which is hot and extremely tender. It is not a very common disease, and merely requires the ordinary low *treatment*, by purging physic, and, if necessary, bleeding. Should it continue for more than two or three days after these are tried, an ounce of nitre may be given every night in a bran mash.

ORDINARY SWELLING OF THE LEGS, OR *œdema*, occurs in every degree, from a slight "filling," to which many horses are always subject, whether they work or stand in the stable, to an enlargement extending up to the stifles and elbows, sometimes rendering the legs almost as round and as hard as mill-posts. When horses are first brought in from grass their legs almost always fill more or less, and until they are regularly seasoned to their work there is seldom that clean condition of the suspensory ligaments and back sinews which one likes to see even before the daily exercise is given. The *œdema* appears to depend partly upon a deficient action of the kidneys, but chiefly on the vessels of the legs not acting sufficiently without constant walking exercise, such as is natural to the horse when at liberty, and which he takes at grass. Half an hour's walking will generally produce absorption completely, so that a daily remedy is forthcoming; but as a rule, whenever there is this tendency to "filling" of the legs, the cellular membrane is not the only tissue in fault, but the tendons and joints are also liable to inflammation. The *treatment* will greatly depend on the exact cause. If the swelling is only due to the change from grass to the confinement of a warm stable, time alone is wanted, taking care not to overwork the horse in the mean time. Bandages will always assist in keeping down the swelling; but they should not be used without necessity, as when once the horse becomes accustomed to them his legs can hardly be kept fine without their aid. If weakness is the cause, a drachm of sulphate of iron given in the corn twice a day will often strengthen the system, and with it the legs. Diuretics may be adopted as an occasional aid to the kidneys, but they should be of the mildest kind, such as nitre, or they will do more harm, by weakening the body generally, than good by their stimulus to the kidneys. Indeed, they are often the sole cause of

the legs filling, for some grooms use them so continually, whether they are wanted or not, that the kidneys become diseased and refuse to act, which is a sure forerunner of œdema. Where swelling of the legs is confirmed, bandages must be regular^y applied as recommended at page 196.

CHAPPED HEELS.

WHEN A HORSE SUFFERS FROM ŒDEMA of the legs, he is particularly prone to an eruption of a watery nature in the cleft between the heels and behind the lesser pastern. Those also whose legs are washed and not dried are still more prone to it, especially if the hair is white. The skin cracks, and, in bad cases, is so inflamed and swollen that the leg cannot be bent without great pain, and often there is a bleeding from the cracks, caused by the action of the limb, but only to a sufficient extent to show that blood has escaped. The *treatment* must be local as well as general if the eruption is not entirely due to mismanagement. In any case, the part should be dressed with cerate of acetate of lead, a little of which should be rubbed in every night. Next morning some glycerine should be brushed on an hour at least before the exercise, and renewed before the daily work is commenced. This will prevent all risk of the skin cracking, while the ointment will act beneficially on the vessels of the part. In addition to these applications, the general health should be attended to if in fault, and tonics or diuretics should be given, as the case may require.

GREASE.

THE ERUPTION KNOWN AS GREASE is sometimes only an aggravated form of chapped heels, and is often preceded by them. At others the appearance of the disease is ushered in by constitutional symptoms, such as feverishness, œdema of the limbs and hide-bound. The first local *symptom* is a slight swelling of the skin of the heels and adjacent parts, which soon cracks, and from the fissures there exudes an offensive discharge which looks greasy, but is really watery, being of a serous nature. It inflames every part that it touches, and has a tendency to cause a spread of the eruption in all directions, but chiefly downwards. The legs go on swelling to a frightful extent, and are thereby rendered so stiff and sore that great lameness is produced. If this stage is neglected the whole surface ulcerates, and a fungous growth makes its appearance, chiefly from the original cracks. The discharge becomes purulent and has a most foul smell, and the leg can with difficulty be bent at all. *Finally*, the fungous excrescences cover the whole of the diseased skin, being of a bright red color, and slightly resembling grapes in form, from which circumstances this stage has been

called "the grapes." It is now very rare to meet with grease in any of its forms except in the cart-stable, where the hairy legs of its inmates render them peculiarly prone to its attacks, from the time required to dry them when wet. They are so difficult to clean without water that the carters may well be excused for using it, but if they do they ought carefully to dry the legs afterwards. The *treatment* when grease is established must be founded upon the same principle as in chapped heels. The skin must be kept supple, and at the same time stimulated to a healthy action. For the former purpose glycerine is most valuable, being far more efficacious than any greasy dressing, such as we were obliged to employ before the discovery of this substance. In all the stages of grease, this latter agent may be employed, and as it is readily soluble in water it can be washed off and renewed as often as it may be desired. The discharge is so foul and irritating that it ought to be thoroughly removed at least once in twenty-four hours, and one of the chief advantages of the use of glycerine is that it so greatly assists this cleansing process from its solubility in water. In addition to this emollient plan, some stimulus must be selected, and none answers so well (in all stages but the very earliest) as chloride of zinc. When, therefore, the heels are in that state that it is almost doubtful whether the disease is the mere chap or absolute grease, the treatment recommended for the former may be tried, but should this fail, the groom should at once proceed to cut the hair of the skin which is diseased as short as possible. Then let him take some soap and warm water and gently wash the parts with a sponge till the skin is perfectly clean and free from scab or scurf, taking care to remove every particle of soap by well rinsing it. Next dry the leg, and then with a small paint-brush rub gently into the inflamed parts enough of the following lotion to damp them, but not to wet them thoroughly:—

Take of Chloride of Zinc	30 grs.
Water	1 pint. Mix.

A quarter of an hour afterwards apply a little glycerine over the whole, and keep the parts sufficiently supple with it. If there is much discharge the cleansing may be repeated night and morning, followed by the chloride of zinc, but in most cases once a day will be sufficiently often. If the ulcerated or inflamed skin does not put on a healthy appearance in a few days, the lotion may be increased in strength, using forty, fifty, or sixty grains to the pint, as required; but the remedy will be found to be almost a specific, except for the grapy form, if properly proportioned in strength. When the fungoid growths are very extensive, nothing but their removal, either by the knife or by the actual or potential cautery, will suffice. The least painful plan is to slice them off to a level with the skin

and then just touch the bleeding surface with a hot iron, which will have the double good effect of stopping the bleeding and inducing a healthy action. The glycerine may then be applied, and next day the leg may be treated in the same way as for ordinary grease described above. When the disease is of long standing local applications may cure it for a time, but either it will return, or there will be some other organ attacked, unless the unhealthy state of the blood is attended to. It must be remembered that during the existence of grease this vital fluid is called upon to supply the materials for the secretion which is constantly going on. Now if on the cessation of the demand for them the blood still goes on obtaining its supplies from the digestive organs, it becomes overloaded, a state of plethora is established, which Nature attempts to relieve in some one or other of her established modes by setting up disease. To avoid such a result arsenic may be given internally, for this medicine has a special power in counteracting this tendency. How it acts has never yet been made out, but that it does exert such a power is thoroughly ascertained, and if the doses are not too large it is unattended by any injurious effect. Indeed for a time it seems to act as a tonic. The arsenic should be given in solution and *with the food*, so as to procure its absorption into the blood without weakening the stomach. A wine-glassful of liquor arsenicalis (1½ oz.) should be poured over the corn twice a day, and continued for a couple of months, when it may be discontinued with a fair hope of its having had the desired effect. Should the skin, however, look inflamed, a second course of it may be given, and it will be found that if it is given with the corn it will not be followed by any injurious consequences.

WARTS.

WARTS are, generally, only to be considered as eyesores; for, unless they appear on the penis, they are not injurious to health; nor do they interfere with work unless they happen to appear on the shoulders beneath the collar in a harness horse, which is very rare indeed. They are, doubtless, very unsightly, and, for this reason, it is often desired to remove them, which may be done by first picking off the rough outer surface, so as to make them bleed, and then rubbing in, with a stiff brush, some yellow orpiment, wetted with a little water. This will cause considerable inflammation, and in a few days the wart will drop off, leaving a healthy sore, which soon heals. Sometimes the whole wart does not come away on the first application, in which case a second must be made. When the glans penis is completely covered with warts.

the best plan is to amputate it, as it requires the greatest caution and tact to remove them by arsenic or any other caustic without destroying, also, as much of the penis as is taken away by the knife.

CORNS.

THESE TROUBLESOME results of bad shoeing, or subsequent neglect of the feet, make their appearance in the sole of the foot, in the angle formed between the crust and the bar (see fig. 20 (E), Chap. XXVI.). Where the foot is properly prepared for the shoe, and the smith seats the heel of the crust and the bar on a level surface, no corn will make its appearance in a healthy foot; but if a corn has previously existed, or if the shoe is allowed to press upon the sole at E (see fig. 20, Chap. XXVI.), the delicate blood-vessels of the sensible sole are ruptured, and, instead of secreting a sound horn, capable of bearing the slight strain upon it which is required, a fungoid growth is formed, presenting a reddish appearance, and exquisitely sensitive. This morbid substance does not at all resemble the hard corn of the human subject, which is a thickened secretion of cuticle, but it bears some comparison with the soft corns that form so often between the toes, and give so much trouble in their removal. It is, in fact, a new growth of a semi-fungoid character, partly made up of granulations and partly of horny matter, the two being closely united. The corn may arise from improper pressure made on this part of the sensible sole, either directly from the shoe, or indirectly by pressing a thin brittle crust inwards upon it. Generally, however, it is met with at the inner heel, from the shoe being overgrown by that part of the foot when kept on too long. The outer nails do not allow it to work in the contrary direction, and if there is a clip on the outer quarter this is rendered still more improbable. If, therefore, shoeing is properly managed, corns may always be prevented, and we shall see in the directions for shoeing, at Chap. XXVI., how this is to be managed. At present I have to consider how they are to be relieved or cured when they are already established.

THE ORDINARY MODE OF TREATING CORNS is simply to cut them out, leaving the bar and heel of the crust full, and thus taking all pressure off them. This enables the horse to do his work for about ten days, but then the shoe must be removed, and the paring-out repeated, a process which weakens the already weak crust by making additional nail-holes in it. The shoe at the same time is generally "sprung," that is, it is so bent or filed that the heel does not fully bear upon it; but this does not last many hours, and is of little real utility. The plan answers well enough for the purposes of fraudulent sellers, as the horse runs sound for about ten days; and when he fails, and on taking off his shoe he

is discovered to have a corn, it is impossible to prove that it existed at the time of sale by any evidence but that of the smith who shod him previously to it. Excepting, therefore, in very slight and recent cases, in which it will sometimes be followed by success, this plan of treatment is only palliative, and what is worse, it tends to increase the weakness of the foot and consequent tendency to the disease.

FOR THE CURATIVE PLAN we must do something more than merely take the pressure off the sole; the bar and heel of the crust must also be relieved, and the sensible sole must be stimulated, by a proper application, to secrete healthy horn, as well as by pressure on the frog. If the horse is to be rested, this can be done easily enough by taking off his shoes, but he may be kept at work by putting on a bar-shoe, and cutting down the bar and crust, so as to throw all the pressure off them upon the frog. A double purpose is effected in this way. First, the sensible sole is relieved of the constant pressure which the crust bears upon it laterally; and, secondly, the jar on the frog, communicated through the shoe, from the ground, induces a healthy action in the foot, and the sole has a greater tendency to secrete healthy horn. There is no doubt in my mind that all horses would work much better, and keep their feet in much sounder condition, if their frogs could be brought into use, without being guarded as they are by the ordinary shoe. This part is intended by nature to take upon itself great pressure; and if it has not its natural stimulus it becomes weak itself, and, moreover, it does not stimulate the surrounding parts to a healthy action, as it ought to do. The bar-shoe is inconvenient for many purposes, and, therefore, it is not generally applied; but as a curative agent these objections are to be dispensed with, and then it will be found to be extremely valuable, not only in relieving the diseased part (the corn) but in giving a healthy action to its seat, the sole. The smith should, therefore, pare down the crust at the heel, so that when the bar-shoe is applied it will allow a penny-piece to be insinuated between the two surfaces. With this the horse does his work comfortably on the road; and in process of time, that is, in two or three months, the heel grows up, and takes its own share of pressure, or a part of it, becoming gradually accustomed to the amount which it will have to bear when the bar-shoe is discontinued. In the mean time a little of the following lotion may be applied daily to the situation of the corn by means of a feather.

Take of Chloride of Zinc	1 drachm.
Water	6 oz.
Glycerine	2 oz. Mix.

In every case, the bar-shoe must be continued until the heel of the crust and the bar grow down strongly; and then a common shoe may be applied.

SANDCRACK.

IN THE ANATOMICAL DESCRIPTION OF THE FOOT, at page 291, it will be seen that the crust is composed of fibres, running parallel to each other in a direction from the coronet to the ground surface. These fibres are glued together firmly in a sound and strong hoof; but, in a weak one, it sometimes happens that the gelatinous matter is not in sufficient quantity, and then the fibres separate, and leave a crack of greater or less extent, according to circumstances. This, called a sandcrack, happens at the thinnest part, which is the inner quarter in the fore foot, and the toe in the hind. *To cure it*, the foot must be rested, or at least that part of it where the crack occurs, which in the fore foot may be effected by the use of a bar-shoe, throwing the pressure entirely on the frog, as recommended in the last section on corns, and taking care that the crust behind the crack is not in contact with the shoe. By adopting this plan, I have succeeded in curing sand-cracks during moderate work; but if it happens in the hind foot, complete rest must be given, as the toe cannot be relieved by any possible contrivance. The next thing to be done is to open the crack slightly, so that any grit getting into it shall not cause its further expansion; and in doing this, if there is any little cellular cavity, it should be exposed. If the crack extends to the coronet, which it rarely does, nothing can be done until it has grown out for at least half an inch from that part, when the point of a hot iron may be applied to the angle of the crack for a second, so as to keep out water, which has the effect of causing the fibres to split by the capillary attraction which is exercised. The burn should be very slight, and should not be carried deeply into the substance of the horn. A fine nail should then be driven from below through the crust, the shoe being removed; and when brought out at the usual place, should be left projecting. The shoe should be put on, and the innermost nail also left projecting. These two should then be firmly bound together by fine wire, so as to bring the edges of the crack together; and the foot should be left in this state for at least a month or five weeks, when the shoe may be taken off, and the operation repeated. This is far better than binding wire or twine round the whole foot, as it acts more completely on the crack, without confining the growth of the remainder of the foot. Of course, after the wire is twisted on, the nails must be clenched, and there will be a greater projection than usual; but this is of no importance whatever. In cracks of the hind foot the nails in each quarter will keep the two sides from separating, but the horse cannot be worked.

FALSE QUARTER.

WHEN, FROM AN ACCIDENT, the coronary substance is permanently injured, it ceases to secrete sound horn, and a stripe of the

crust, defective in strength, runs all the way down from the coronet to the plantar edge. This generally happens at the inner quarter, and is owing to the horse treading on his coronet; but it may also occur on the outside, either from the tread of another horse, or from some kind of external violence. The result is similar to that of a sandcrack; there is no strength in the affected heel, and lameness is produced. The *treatment* is very much the same as for sandcrack. In the first place, the pressure must be taken off the quarter, and a bar-shoe applied, so as to convey the weight on the frog, as described under the head of Sandcrack. The heel of the affected quarter should be lowered, and thus further injury will be prevented. The next thing to be done is to stimulate the coronet to a healthy action by blistering it, which must be done two or three times, taking care that the blister is not of too violent a nature, and that the skin heals before a second is applied. By these means, a cure may sometimes be effected; but it takes a considerable time, and until the quarter is reproduced in full strength, or nearly so, the bar-shoe should be continued. By its use, any horse with a sound frog can travel very well on the road, even if the quarter is entirely and permanently separated from the toe by inefficient horn; and without it, the chance of a cure is not to be reckoned on.

QUITTOR.

BY THIS TERM IS UNDERSTOOD a chronic abscess of the foot, the matter always forming sinuses, from the difficulty which nature has to overcome in finding a way for it to reach the surface. Generally, the mischief is occasioned by an overreach, or a bruise of the sole, or by the inflammation resulting from a neglected thrush, or, lastly, from a nail-priek. From any of these causes, inflammation of the delicate investment of the coffin-bone is set up, pus is secreted, and, in working its way to the surface, it burrows between the horn and the bone, and forms one or more sinuses, or pipes, as these fistulous tubes are called by the farrier. A quittor is recognised by the eye and nose detecting an opening in the horn, from which a foul discharge proceeds; and on introducing a probe, it will generally pass freely in two or three directions, sometimes giving a grating sensation to the finger, showing that the bone is denuded, and most probably carious. There is generally a considerable increase of temperature in the foot, and always more or less lameness, with, in most cases, swelling of the bulbous heels and coronet. On examining the sole carefully, some part will either show a difference of color from the adjacent horn, or there will be a yielding on pressure, owing to its being undermined. The *treatment* must be conducted on the same principle as for fistulous sores. In the first place, a dependent opening must be

formed, so that no matter shall be confined, but it shall be allowed to come away as fast as it forms. This can only be done by probing; and if the original opening is in the coronet, the probe must be passed down as low as possible, and then the sole should be pared away till the end can be reached. In tolerably recent quitters, this plan alone will allow the sinus to heal; but in old ones, the internal surface has become callous, and no granulations are thrown out. Here an injection should be thrown in every day with a syringe, a saturated solution of sulphate of zinc being that generally recommended; but I have found the chloride answer still better, using one drachm of the salt to a pint of water at first, and going on up to two drachms. By injecting this daily, and introducing a piece of lint, wetted with it, into the superior opening, leaving the lower one free, I have cured many bad quitters, even when there was evidence of caries of the coffin-joint. The disease requires a careful adjustment of the remedies to its extent and nature, and a theoretical description of it is of little use.

THRUSH.

ANY OFFENSIVE DISCHARGE FROM THE FROG is called by this name, although the cause and treatment may be as different as possible. It varies greatly in the fore and hind feet; and, indeed, it must never be forgotten that, in every case, the cause which has produced the discharge must be clearly made out before any plan of *treatment* can be carried out with any prospect of success. Sometimes thrush is merely the result of the decomposition of the horny frog, from the foot being constantly kept wet with urine, which is most common in the hind foot. Here the surface becomes soft, and is gradually dissolved; while the cleft, from its retaining the moisture, is increased in size. This state is often brought on by the too frequent use of cowdung-stopping in horses with soft frogs; and, instead of doing good by his treatment of the foot, the groom is really destroying it by encouraging the decomposition of the healthy defence which Nature has given to it. For this kind of thrush, very little treatment is required, if the cause which produced it is withdrawn. Still it is not always easy to keep the frog dry, and stop the decomposition, without the application of some astringent; and if the mere use of dry litter, and the application of tar ointment, do not seem to harden the frog at once, it may be touched with a wash composed of ten grains of bluestone to the ounce of water. This will soon dry it; or, if it fails by any chance, the chloride of zinc may be used in the same way, by dissolving five grains in an ounce of water.

THE SECOND KIND OF THRUSH is that in which from a gross habit of body there is a simple inflammation of the sensible frog, and instead of sound horn being secreted, a spongy substance is

deposited, which breaks away in places, and the frog looks ragged and uneven, with a greasy surface, smells very foul, and *feels* hot to the touch. Here the *treatment* must be general as well as local. A dose of physic should be given, the food should be of a less stimulating quality, and care should be taken that regular exercise is allowed every day. The stable should be kept cool, and of course attention should be paid to cleanliness both of the foot and the litter. As to local remedies, they must not be of the stimulating kind, which will suit the thrush from decomposition, or that presently to be described. The foot should be placed in a bran poultice, and kept in it for some days, till the united action of the local and general treatment have reduced the inflammation. After a few days it will be well to dress the frog with tar ointment, or the poultice will do more harm than good, by causing the decomposition of its horny covering, and indeed it is seldom that this wet application should be employed for more than a week. After this time has elapsed, all the good to be derived from it has been accomplished, and the subsequent treatment may generally be effected by attention to the health, and dressing the frog with tar ointment. Sometimes it may be necessary to employ a slight stimulus, and then the solution of chloride of zinc will be found to be the best.

THE THIRD KIND OF THRUSH occurs in contracted feet, and is due to the same cause, namely, chronic inflammation of the sensible frog, produced by overwork, aided in many cases by neglect in shoeing. There is a tendency to the secretion of unsound horn over the whole foot, sometimes too thick and hard, and at others of a cellular structure, without sufficient strength to bear the pressure of the road. The horny frog generally looks shrunken and withered; and in its cleft there is a foul discharge, on wiping which out a soft spongy matter may be seen at the bottom, which is the sensible frog itself, but in a diseased condition. In bad cases, the sides of the horny frog have separated, and even the toe is sometimes deficient of its covering; but generally the horn has only disappeared in patches, and there are ragged portions remaining. The disease here is of too chronic a nature to be easily cured, and if there is much disorganization of the laminæ it will be almost impossible to effect a perfect cure. The first thing to be done is to clear away all the ragged portions of horn, so as to be able to reach the sensible frog. Some tow is then to be smeared with the following ointment:—

Take of Ointment of Nitrate of Mercury	1 drachm.
Zinc Ointment	1 oz.
Creosote	4 drops. Mix.

and pressed into the cleft of the frog, where it can best be retained

by a bar-shoe lightly tacked on, and in this case taking its bearing on the heels and not on the frog. Sometimes a wash answers better than a greasy application, and then a strong solution of the ehloride of zinc may be employed, about six grains to the ounce of water. Tow dipped in this may be applied in the same way as with the ointment, and either one or the other should be re-applizd every day. As the new horn grows, it must be kept supple by tar ointment, and until it is fully developed the bar-shoe should be kept on, applying some degree of pressure by means of the tow, which should be stuffed in so as to compress the frog, beginning with very light pressure, and, as the horn increases in substance, augmenting it in proportion. By attention to these directions a thrush of this kind may be cured, if the foot is not damaged throughout, and even the frog may be restored to a comparative state of health.

CANKER.

CANKER is generally an extension of the third form of thrush, the ulceration spreading to the sensible sole, and afterwards to the coffin-bone itself. At first the ulcerated surface is concealed by the old horn, but gradually this breaks away, and then the extent of the mischief may be seen. A part or the whole of the sole and the frog may be in a state of ulceration, generally depending upon the time during which the disease has been in existence, and the care which has been taken of it, or the reverse. The only *treatment* to be adopted is the careful removal of every loose piece of horn, so as to expose the unsound surface to the action of remedies, and at the same time to avoid poisoning it by the decomposing horn, which has a most irritating effect. The sulphate of copper, and ehloride of zinc, are the best applications, and they must be used in full strength. These cases, however, require an experienced eye to enable the prescriber to judge of the proper amount of caustic required; and beyond suggesting the kind of remedy required, no good can be done by written prescriptions. If it is impossible to obtain the advice of a veterinarian, it will be better to begin by using a mild caustic, and then increase the strength as it is found to be wanted. Pitch ointment forms the best greasy application to the adjacent sound surfaces to protect them from the irritation of the discharge.

LAMINITIS.

(*Founder or Fever of the Feet.*)

THE TERM LAMINITIS is now familiar with every one at all accustomed to horses, though it has not long been introduced into the vocabulary of the professional man. The disease, however, has been recognised for many years under the terms "founder" and "fever of the feet." It consists in an inflammation (which

may be acute or chronic) of the parts between the crust or wall and the pedal bone, including the laminæ, whence the name by which it is now distinguished. These parts are supplied with a profusion of blood-vessels (see page 294), and when inflammation is set up in them the progress which it makes is rapid, and the constitutional disturbance is unusually great, owing probably to the want of space for the swelling which accompanies all inflammations, and especially of vascular substances. The *causes* are either, 1st. Localization of fever, whence the name "fever in the feet." 2d. The mechanical irritation of hard roads upon feet not accustomed to them; and 3d. Long confinement in a standing position on board ship. When it is recollected that in our system of shoeing, the laminæ are made to support the whole weight of the body in consequence of the shoe being in contact with the crust only, it can only occasion surprise that this disease is not more frequent. Nature framed the horse's foot so that an elastic pad should interpose between its back parts and the ground, intending that the edge of the crust should take its share, but not *all* of the weight. The laminæ are therefore called upon to do far more than their structure is designed for, and when there is the slightest weakness or tendency to inflammation, they are sure to suffer. Acute laminitis is not very often met with, because horsemen are aware of the risks they run, and take their measures accordingly; but the chronic form is common enough, and hundreds of horses are more or less lame from this cause. Too often it is not suspected until irreparable mischief is done, the elasticity of the laminæ being destroyed, and the foot having assumed a shape which utterly unfits it for bearing the pressure of the shoe upon hard roads. When the disease has been going on for a long time, the elastic substances between the laminæ and the pedal bone, as well as the fine horny lamellæ between them and the crust, lose the property of extension, and the horn of the crust is secreted by nature of a more spongy character, and much thicker in substance, than in health. On making a section of such a foot, the arrangement of parts will be such as is here delineated in fig. 19, in which 1 is the os suffraginis, 2, the os coronæ, and 3, the pedal bone, with its anterior surface separated from that of the crust (7) by a wide space occupied by spongy matter. Here the toe of the pedal bone projects into the sole and renders it convex, instead of being concave, and corresponding with the lower surface of the pedal bone.

The laminæ and elastic substances between them and their contiguous structures no longer suspend the pedal bone to the crust, but the weight falls partly upon the sole by means of the toe of the pedal bone, and partly on the frog, which descends so low that in spite of the thickness of the shoe it touches the ground

This descent of the frog is a very marked feature in laminitis, and whenever it is apparent that disease may be suspected.

BUT TO PRODUCE SUCH A MARKED ALTERATION OF FORM as is here delineated and described takes a long time, and even then it is only in a few cases that the disease reaches to this stage. It will, therefore, be necessary to trace its progress from the commencement, and the effects which are exhibited as it goes on.

WHEN ACUTE LAMINITIS SETS IN, there is a considerable amount of fever, indicated by a rapid pulse, usually full and hard, and hurried respiration. There is a general look of restlessness from pain, the horse stamping gently with his feet, and constantly lying down and then getting up again. When, as usually happens, the fore feet only are affected, the hind feet are brought under the body to bear as much weight as possible, and the fore feet are so carried forwards that the heels support the legs rather than the toes. On examining the feet, there is great reluctance to allow one to be picked up, on account of the necessity which is thrown upon the other of taking the whole weight of the fore quarter. The coronet and hoof feel very hot, and, when wetted, may be seen to steam very perceptibly. If this state of things is not speedily stopped, the laminae cease to secrete horn, and the connection between them and the hoof ceases, causing the latter to separate, and the sensible parts to be exposed, covered with a thin scaly horn. This has happened in many cases which have afterwards secreted new hoofs; but the horn is not so strong and useful as before, and a horse with such feet is not fit for hard work on the road. If proper treatment is adopted, the inflammation either subsides entirely, leaving no mischief behind it, or there is a chronic inflammation left which induces the alterations of structure which have been alluded to. The *treatment* should be by first removing the shoes, and then, after paring down the sole so as to allow of the expansion of the sensible parts, a large quantity of blood is taken from the toe, making sure that a vessel of sufficient size is opened to produce a strong shock on the heart and arteries, as well as to relieve the local affection. If the blood does not flow freely, the foot may be

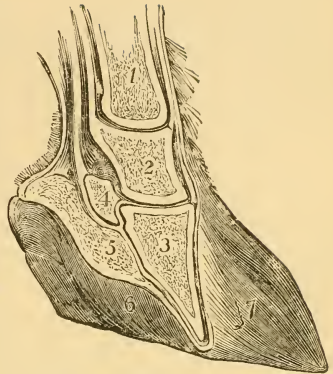


FIG. 19.—SECTION OF THE FOOT IN CONFIRMED LAMINITIS.

1. Os suffraginis.
2. Os coronæ.
3. Pedal bone.
4. Navicular bone.
5. Frog.
6. Sole.
7. Wall or crust greatly thickened.

placed in a pail of warm water, but when the operation is properly performed there is never any difficulty in obtaining any quantity of blood which may be required. Next tack the shoes on lightly again, and then give a smart dose of physic, or else, what is perhaps a better plan, give the following:—

Take of Barbadoes Aloes

Tartar Emetic, of each 1 drachm.

Powdered Digitalis $\frac{1}{2}$ drachm.

Syrup enough to form a ball,

which should be given every six hours, until the bowels act, when the other materials may be continued without the aloes. The feet should be kept constantly wet and cool by tying a piece of felt or flannel around each pastern, and allowing it to fall over the hoof, when it is to be continually wetted. If the inflammation is not abated next day, the bleeding may be repeated, and it will be well also to act on the kidneys by adding two or three drachms of nitre to the tartar emetic and digitalis.

CHRONIC LAMINITIS is generally first shown by a slight soreness or lameness, generally appearing in both fore feet, and, therefore, being often overlooked by casual observers. In coming in from work the coronets feel warmer than natural; but this goes off during the night, and, for a time, no great fears are entertained of the feet recovering their former condition, the blame being, perhaps, laid upon the shoe. In a month or two, however, the smith (who has, perhaps, been ordered to take off the shoes two or three times, by which the injury is increased) finds that his nails do not hold, and the quarters break away; while the action of the horse becomes more shambling every day, and he cannot make a sound trot on any hard road, *especially with a weight on his back*. In many cases a horse with chronic laminitis can run in hand sound enough for an ordinary observer; but when the extra weight of a rider is placed on him the feet cannot bear the pain, and the gait is shambling in the extreme. Such animals have a strong propensity to save their toes, and prefer (if their shoulders will allow it) bringing their heels to the ground first, so that, although their action is excessively low and shambling, they seldom fall. An experienced horseman at once detects this peculiar style of going, and condemns its possessor for laminitis. Indeed, it may be assumed as a rule, that wherever the heel is put carefully down upon the ground *with low action*, the foot is the subject of laminitis to some extent. When the heel is naturally brought to the ground first, the knee is well bent, and the foot is raised high in the air; but in process of time work tells on it, the laminæ become inflamed, and then the action is reduced in height, and the feet are moved in the manner peculiar to foundered horses, including those which before they were foundered perhaps exhibited “toe action,” or, at all events,

a level fall of the foot. This state of disease ought to be well studied, and compared with the remarks on sound action at page 82 *et seq.*, which it will serve to illustrate and explain. The foot itself is changed in form, and the toe and sole have more or less altered their relations, as explained already. Sometimes there is a large space or cavity between the outer surface and the inner, shown at 7, fig. 19, page 405. This hollow in the crust is more or less cellular, and the disease is called a "seedy toe," but for what reason I am at a loss to know. The sole, moreover, is always either flatter than natural or absolutely convex, and its horn is brittle and spongy, constituting what is termed the "pumiced foot." The frog is generally large and spongy; and on placing a straight-edge across the shoe, from heel to heel, it is found to touch that part, or nearly so, indicating that the relations between it and the crust, as well as the sole, are altogether changed from a natural state. The laminæ are no longer slings for the foot, but the whole pressure is taken by the parts lying beneath the pedal or coffin bone and the navicular bone. Such being the *symptoms*, the next thing is to consider what can be done. If the disease is of long standing, little hope can be given of a perfect recovery. The shape of the external parts may be partially restored, but the internal delicate structures no longer have the power of performing their offices; and the elastic action of the horse suffering from the effects of laminitis can seldom be restored on hard ground. After proper treatment, he may, and generally does, go on turf well; but either on hard ground or on plough (on the latter of which, though soft enough for the laminæ, the sole has to bear considerable pressure) he is dreadfully sore and lame. This is shown after all inflammation has ceased, the foot being as cool as possible, and sometimes exhibiting very slight evidences of previous mischief.

In *treating* such cases, if there is no heat or other sign of inflammation, bleeding and similar lowering measures will be of no avail. They may be required soon enough, it is true, for a foundered foot is always in danger of inflammation when battered; but until symptoms of this kind of mischief are exhibited it is better to avoid all depletory measures. At the same time, everything which will tend to keep off increased action should be avoided; the horse should be fed on the least heating food which will serve the purpose for which he is intended, and his stable should be kept as cool as possible. Beans ought never to be allowed to the possessor of feet with the slightest suspicion of founder; and no more oats should be used than are necessary for the condition required. For horses at slow work, bran mashes and nitre, with small doses occasionally of physic, will serve to keep down the tendency to inflammation, and by their use, joined to cold applications *after work* (they are of no use at other times),

and a cool stable, the horse may be enabled to do moderately fast work. If the frog is not very prominent, a leather sole, put on in the usual way, will save the jar, and in some measure supply the place of the natural elastic tissue, destroyed in this disease. Usually, however, it only adds to the mischief by increasing the pressure on the frog, and then the leather must be introduced between the foot and the shoe, but cut to the same shape as the latter, so as not at all to bear on the frog. Many horses with slight traces of laminitis can work for years with leather applied in this way, and it may be said to be the most useful mode of treating this disease when exhibited in a mild form. Sometimes by throwing a horse by for six months, taking off his shoes, and blistering his coronets two or three times, a great deal of good may be done, but he must be put to stand on tan or sawdust during the whole time, and never allowed to go on hard ground, even for half a mile at a walking pace. By this plan, and by very careful and gradual increase of exercise at the end of that time, I have succeeded in restoring an elastic condition of the foot; but I have never known one so patched up bear hard work, and I should never advise the risk incurred by submitting him to it. Hunting and racing, or, indeed, any kind of work on soft ground, will do no harm; but battering on the roads, especially without leather, applied as above described, is sure to bring back the inflammation.

THE SEEDY TOE.

THIS TERM is so generally employed among horsemen, that though the state which it describes is one of the ordinary consequences of laminitis, I prefer to give it a distinct section. I have already described its nature in the preceding page, and have only now to allude to its *treatment*. This may generally be so conducted as to restore the shape of the foot, if the inflammation has not lowered the toe of the pedal bone, as shown at fig. 1; for if this has taken place, although it is perhaps possible to get rid of the cavities in the horn, the relative positions of the bony parts cannot be changed. When, however, as is often the case, a moderately small hollow has been formed between the layers of the wall, and the foot retains a tolerably healthy shape, by cutting away all the external horny walls, exposing the parts in contact with the laminae, and resting the horse in a loose box, the secreting surface will form a new wall, without any spongy texture, in the course of three or four months, if the coronary band is constantly stimulated by external applications. To effect this, the horse should be put to stand on red deal sawdust, without shoes; and his coronets, after being gently stimulated by a mild liquid blister, should be kept dressed with tar ointment, which should also be applied to the exterior of the horn. It is seldom, how-

ever, that a foot which has been thus treated is sufficiently sound to bear hard work.

CONTRACTION OF THE FOOT.

THIS REPUTED DISEASE has been long the bugbear of the horse-master ; but it is now discovered to be a complete mistake. Some of the most contracted feet in point of width are particularly free from all risk of disease, and on the other hand many open ones are as liable to it. The donkey, whose heels are shaped exactly like those of the contracted horse's foot, is so seldom lame, that few can recall having seen one in that condition, and, therefore, reasoning from analogy, one would be led to doubt that this shape renders the horse prone to lameness. At the same time it is quite true that in the disease which will next be investigated, the frog withers and contracts, and the heels are thereby drawn in ; but here the contraction is a consequence and not a cause of disease, and certainly cannot be considered as a disease in itself. Bad shoeing will do much to cause either laminitis or navicular disease, and it will certainly produce corns and inverted heels, but it will not waste the frog, or induce that condition of the foot where the sole is arched so high that the frog does not touch the ground when the shoe is off. Such a state of things can only be brought on either by thrush or navicular disease, and is never the result of the mechanical mismanagement of the foot, to which what used to be called contraction was generally attributed. All sorts of plans have been suggested for expanding the heels and for allowing them to expand ; but the real truth is that so long as the frog is sound and the parts above it, allowing the proper amount of pressure to be communicated to the sole, bars and heel of the crust, these latter divisions of the foot have no room to contract, and of a certainty they never do.

NAVICULAR DISEASE.

THIS FORMIDABLE DISEASE, called also the navicular *joint lameness*, and *navicularthrititis*, is the chief danger to be apprehended from a good-looking strong foot, just as the open flat one is prone to laminitis, and is rarely subject to disease in the navicular joint. The reason of this immunity on the one hand, and the contrary on the other, is this. The open foot, with a large spongy frog, exposes the navicular bone and the parts in contact with it to constant pressure in the stable, so that these parts are always prepared for work. On the other hand, the concave sole and well-formed frog are raised from the ground by our unfortunate mode of shoeing, and when the whole foot is exposed to injury from battering, and in addition the tendon which plays over the navicular

bone presses it against the os coronæ, the unprepared state in which this part is allowed to remain is sure to produce inflammation, if the work is carried far enough. Thus in each case the weak part suffers, but occasionally, though very rarely, the foot with an arched sole contracts laminitis, and the flat one is attacked by navicular disease; the exceptions, however, are so few that they may be thrown out of the calculation, and from the shape of the foot alone it may almost invariably be pronounced, when a horse is known to be subject to chronic lameness, whether its seat is in the laminæ or in the navicular joint.

WHEN A FOOT IS EXAMINED AFTER DEATH which is known to have been the subject of navicular disease, the parts implicated are invariably either the navicular bone, or the soft parts in contact with it, or often all together. Most frequently on dividing the tendon of the flexor perforans and turning it down so as to expose the back of the joint between the navicular and coronal bones, that part will be greatly thickened and inflamed, the tendon being often adherent to it. In the healthy condition there ought to be no adhesion of the fibres of the tendon to any part of the navicular bone but its postero-inferior edge, to which the tendon is fixed by some few fibres, the bulk passing on to be inserted in the os pedis. The posterior face of the navicular bone should be beautifully smooth, and lined by synovial membrane which forms a lubricating sac for it to play upon, and thus take off the friction between the tendon and the bone. Such is nature's provision against mischief in this delicate part of the machinery of the foot, which she keeps in order by the constant supply of synovia or joint oil. But when the sac is not stimulated to a healthy action by the pressure of the frog below it in doors and out, synovia is no longer secreted in proper quantity, and as soon as the horse is put to hard work inflammation takes place for want of it. The result is some one of the consequences of inflamed joints. Either ulceration takes place in the postero-inferior surface, where the tendon glides over it, sometimes ending in caries of the bone itself; or adhesion takes place without ulceration of the tendon with the surface of the bone, or there are small exostoses thrown out, or lastly there is simple inflammation without either adhesion or ulceration, and in this stage the disease is amenable to treatment without leaving any trace behind.

The symptoms of navicular disease are the same, whether the mischief has extended to ulceration or not; but the history will guide us in ascertaining how far it has gone. Of course they vary in degree, for there may be only a slight extent of ulceration, or a high degree of simple inflammation; but in the former case the lameness will not be so marked as in the latter, though the prospect of recovery will be much less. There is always more or less lame

ness; but, in consequence of its affecting both feet, it is not so marked to the careless observer as in some much more trivial cases where only one is diseased. The distinguishing sign, though not absolutely infallible, is the pointing of the toe, and a peculiar rounding forward of the fetlock joint, so as to relieve the navicular bone of any weight. In laminitis, the object of the sufferer is to relieve all pressure as much as possible, by bringing the hind legs under the body, and by bearing the weight of the fore quarter on the heels. Here, the reverse of the latter attitude is observed—the heels are not allowed to take any pressure, and the toes alone are placed at all firmly on the ground. This is marked in the stable by the pointing of the toe (in each foot alternately, if both are diseased, but in the one only, if they are not both affected). Out of doors, the toes dig into the ground, the heel never being brought firmly down, and frequent stumbles mark the difference between this species of lameness and laminitis. The subject of navicular disease generally walks sound; but the moment he is trotted, he goes as if his legs were tied together, his stride being shortened in a remarkable manner, but without exhibiting the peculiar fumbling gait of the foundered animal. As in his case, soft ground suits him, and he has no fear of plough, because his sole is hard and unyielding. Many tolerably confirmed cases of navicular disease may, therefore, be hunted, except when the ground is hard, supposing, of course, that they are kept off the road; but no plan of management will enable them to bear the jars incidental to harness-work or hacking. When one foot only is the subject of navicular disease, it often happens that it is smaller altogether than the other; but it is somewhat difficult to say whether this is a cause or a consequence of inflammation. One thing is quite clear, that many horses are met with, still perfectly free from lameness, in which there is a difference of size in their fore feet; but whether or no these are afterwards invariably the subjects of navicular disease, it is almost impossible to ascertain. It is, however, the general opinion, founded on experience, that when this variation exists, navicular disease is extremely likely to attack the smaller foot, if it is not already there; and for this reason, horses with such feet are generally avoided by the intending purchaser.

The treatment of navicular disease, as before remarked, is only successful in the early stage, before either ulceration or adhesion has taken place. If a horse with strong concave soles suddenly becomes lame, points his toe, and shows other signs that his navicular bone is inflamed, he should be treated in the usual way suited to inflammation, and at the same time liberty should be given to the vascular tissues to expand, by reducing the substance of the horn. Bleeding at the toe has the double good effect of abstracting blood, and at the same time weakening the sole, so as to allow

of the expansion which is desired. The operation should, therefore, at once be performed; at the same time, the whole sole may be reduced in thickness, and the heels lowered in proportion. The foot should then (after the shoe is tacked on) be placed in a cold bran poultice, which will soften the horn; and the system should be reduced by the exhibition of the medicines recommended under Laminitis, at page 406. Next day, if the pulse continues high, more blood may be taken; but, in ordinary cases, it is better at once to insert a seton in the frog (see OPERATIONS, Chap. XXV.), and trust to this for relieving the chronic inflammation remaining, by its counter-irritation. But when the disease itself is mastered, there is still a good deal to be done to prevent the injurious effects which are so apt to follow. The horse contracts a habit of stepping on his toes, to prevent hurting his navicular structures; and hence the frog is not used, the heels of the crust and the bars are not strained, and there being no stimulus to the soft parts which secrete them, they waste and contract in size. If the human hand is allowed to lie idle, the palm and the insides of the fingers are covered with a delicate cuticle, which affords so poor a protection to the cutis, that, on using it with any kind of hard work, it actually separates, and leaves an exposed surface, which speedily inflames. But by gradually exposing the same hand to pressure, a thickened and tougher cuticle is secreted; and this will bear any moderate amount of pressure or friction without injury. Nevertheless, even the hand so prepared must be continually stimulated by work, or the skin returns to its original delicate state, and is then exposed to the same risk of injury as before. So it is with the horse's foot, even in a state of health; but this is far more marked after an attack of disease. The tendency then is to produce the natural horny growths of a smaller substance than before; and if the secreting surfaces are not stimulated by pressure, they become doubly idle, and the frog, as well as the adjacent parts beneath the navicular bone, shows a wasted and shrivelled appearance. To avoid the risk of these ill consequences, the horse should be placed, for two or three hours daily, on a bed of wet clay, which will allow the shoe to sink into it, but will yet be tenacious enough to make firm and steady pressure on the frog, while its low temperature will keep down inflammation. No plan is of so much service in producing what is called expansion of the heels and growth of the frog as this; not, as is commonly supposed, from the clay mechanically pressing the heels out, but from the stimulus of its pressure causing the soft parts to secrete more horn, and of a sounder quality than before.

SHOULD THESE REMEDIES FAIL in restoring the foot affected with navicular disease to a healthy state, recourse can only be had to the operation of neurotomy, which is perfectly efficacious in re-

moving the lameness; and if there is no ulceration, and merely an adhesion of the tendon to the bone, it will, by causing the horse to step more on his heels, effect an absolute improvement in the shape of the foot, and hence it has sometimes been considered to have produced a cure. Where, however, there is caries of the bone, or even ulceration of the synovial membrane, the disease progresses even faster than before the operation, and in process of time the joint becomes mechanically unfit to perform its duties.

ACCIDENTS TO THE LEGS AND FEET.

THESE PARTS ARE SUBJECT to a variety of accidents, trifling perhaps in the cause which produces them, but serious in their effects, from the lameness which ensues. The chief of these are ordinary cutting, speedy cutting, and pricks of the foot either from putting the sole down upon a nail or a piece of glass, or driving a nail improperly in shoeing. Bruises and over-reaches also come under this head.

ORDINARY CUTTING may occur either before or behind, the latter being the more common. It is often met with in poor horses, where the flesh is so reduced in substance that the legs are brought nearer together than in a proper condition. Here all that is required is patience, till the legs are restored to their proper relative position, taking care in the mean time that there is no permanent injury done. Usually the inside of one or both feet strikes the the fetlock joint of the other leg in passing it, but sometimes the blow is given higher up, and it may occur anywhere on the cannon bone except just below the knee, when it is called "speedy cutting," which will be separately considered. Sometimes this blow on the side of the cannon bone is either the cause or the effect of a splint, the blow of the foot having a tendency to produce exostosis (See SPLINTS, page 298). But if a splint is thrown out on a part of the cannon bone which comes in the way of the natural action, the horse whose foot previously passed clear of that part of the other leg will hit it, and not only give pain, but cause a considerable access of inflammation in the previous enlargement. In the *treatment*, therefore, of cutting, it is necessary to prevent the habit being continued from the swelling produced either by a splint or by previous blows. A horse perhaps, either from weakness or bad shoeing, hits his leg and produces considerable swelling and soreness. Here, unless the swelling is reduced or protected, there is no chance of preventing the cutting, because there is a projection of the swollen soft parts right in the way of the other foot. No alteration of the shoeing, and no increase of strength or flesh, will be of service until the inflammation is reduced, and the sore, if any exists, is healed, and this can only be done either by rest or by protecting the leg with a boot. The

latter is the better plan, and wherever a horse cuts, it is, in my opinion, advisable to let him wear a boot for some weeks, until the skin is quite sound again and reduced to its proper thickness. A piece of an old rug folded round the leg so as slightly to overlap, and then tied with a tape and turned down over the fetlock joint, is quite sufficient to serve this temporary purpose, and being soft it is well calculated to protect a swollen joint; but if it is worn for any length of time, the pressure of the tape and the friction of the grit from the road wear away the hair, and cause an unsightly appearance, which is sometimes permanent. If, therefore, the cutting is not rectified completely in the course of a month or six weeks, a leather or india rubber boot should be nicely adapted to the joint and buckled round it, the flat surface of the strap not having so injurious an effect as the tape of the cloth boot. When the cutting takes place above the joint, a pad must be adapted to its inside, and fastened round the cannon bone by two or three buckles, according to the height at which the injury takes place.

SUCH IS THE BEST MODE of guarding against the injury done by cutting, but we must also consider how it can be entirely prevented. In the first place it should be carefully ascertained by what part of the foot or shoe the blow is given. Most commonly it will be found, by chalking the inside of the foot, that a small patch is rubbed clear of chalk, about half an inch above the middle of the quarter, and corresponding with the hindmost nail hole, especially when four inside nails are used. When this is the hitting point, if great care is taken to avoid driving in a nail there, the tendency to cut can never be increased as it often is by a raised clench, and at the same time the rasp may safely be used to reduce the thickness of the hoof at least the eighth of an inch, or often much more. The crust is usually here about three-eighths of an inch thick, and very often it is so sound that it will bear to be rasped down till there is only one-eighth left, *provided it has not to bear the pressure of a nail near it*, and that the reduction is not carried up too near to the coronet. In the hind foot the quarter is fully half an inch thick, and it therefore will bear reduction better even than the fore foot. Sometimes the blow is given by the shoe itself, which is fixed on so as to overlap the crust, and then the remedy is simple enough, for this ought never to occur, and can easily be prevented by any smith. But supposing, in spite of these precautions, the cutting still continues after the horse is restored to his natural strength and flesh, can anything be done by shoeing? In most cases this question may be answered in the affirmative, by the use of what is called a feather-edged shoe. By its aid the heels are both raised, not the inner one only (which is entirely useless and even prejudicial, for then the ground surface of the shoe is not a true plane), but both heels, the inner one be

ing narrow, and having no nail holes beyond the two near the toe, so that there is no danger of the web projecting; nor is there any nail hole required, with the fear of a clench rising, or of the crust being weakened so as to prevent its being thinned to a proper degree. By thus raising the heels (in the hind foot especially), the fetlock is less bent, and as in horses that cut there is almost always a tendency in their fetlock joints to bend inwards as well as backwards, this diminution of the angle will not only straighten the leg in a forward direction, but will also increase the distance between the joints, which is the object to be desired. In the fore foot the obliquity in this direction is not so frequent, and then the high heel will be of no use; indeed, it is only when the toes are much turned out that this plan of shoeing the fore foot is ever successful. When cutting occurs before, unless there is this turn out, it is better to put the shoes on in a perfectly level manner, and trust to the reduction of the thickness of the quarter, and the absence of the third nail. If, with these precautions, the horse, when in good condition, still strikes his fore legs, it will be better to put up with the constant use of a boot. Generally, however, if the inflammation is first subdued, and the foot is shod in a perfectly true and level manner, taking care to rasp away the particular part which strikes the other leg, it will be found that the cutting is avoided.

SPEEDY CUTTING is more dangerous than ordinary cutting, because the pain given by the blow is generally more severe, and is often so great that the horse falls as if he were shot. On examining the leg of a confirmed speedy cutter there is always apparent a small scab or bruise on the inside of the cannon bone, immediately below the knee; but in slight cases rest may have been used to allow the skin to heal, and then no mark may possibly be left. A careful examination will, however, generally detect a small bare place, partially concealed by the growth of the adjacent hair. In bad cases the periosteum is swollen, and there is a considerable enlargement of the surface of the bone. In the *management* of slight cases of this kind of cutting, the action should be examined while the hoof is covered with chalk, and the latter should be treated in the same way as already described. If, however, this fails, as it generally does in this form of cutting, there is no remedy but to put on a regular speedy-cut boot, in which there is a pad buckled on the inside of the leg, and reaching from the knee to the fetlock. It must be of this length, because otherwise it cannot be kept in its place, as the leg allows it to slip down until it reaches the larger circumference presented by the joint. Where there is pain and swelling caused by the contusion, it must be treated in the ordinary way, by the application of cold water and tincture of *arnica*, a wine-glassful of the latter in two quarts of water.

PRICKS IN SHOEING occur from the want of skill in the smith,

who drives the nail too near the laminæ, and sometimes even absolutely wounds them. It may be that the nail in its passage upwards is not within an eighth of an inch of these delicate parts, and the horse may not have flinched during the driving of it, but when he is put to work the nail opposes a hard unyielding line to the soft parts, inflammation is established, and possibly even matter is formed which may end in quittor. When, on the day after shoeing, a horse which was previously sound, goes lame, and the foot is hot to the touch, it may generally be assumed that a nail or nails have been driven too near to the quick, unless there is evidence of laminitis from other causes. On tapping the crust with a hammer, the horse will flinch at some particular spot, and there is the nail which is in fault. Sometimes there is little inflammation as yet set up, but the pressure of the nail is sufficient to cause lameness, and in either case the shoe should be taken off. Then, if there is reason to suppose that matter has formed, the opening from which the nail came out should be enlarged, and the matter allowed to escape. If, however, the foot has been merely "bound," it may be either left to nature, with a shoe lightly tacked on, and a wet "swab" round the coronet, or it may be placed in a bran poultice, which is the safest plan.

WHEN A NAIL IS PICKED UP ON THE ROAD, the prognosis will depend upon the part which it has penetrated. If it has entered deeply into the toe of the frog, the probability is that the navicular joint has been wounded, or probably the tendon of the flexor at its insertion into the pedal bone, either of which are very serious accidents. If the wound is further back, there is less risk of permanent injury, as the bulbous heels or cushion of the frog will bear a considerable amount of injury without permanent mischief. In any case the *treatment* should consist in cutting away the horn round the opening, so as to allow of a free escape of matter if it forms. At the same time inflammation should be kept under by cold "swabs" to the coronet, or by putting the whole foot into a bran poultice.

OVER-REACHES, when slight, may be treated by the application of friar's balsam, or tincture of arnica in full strength, which will have a tendency to dry them up and prevent suppuration. If, however, the heel is very much bruised, a poultice must be applied, but even then a little tincture of arnica should be sprinkled on it. When the bruise is so severe that a slough or core comes away, the wound may be dressed with a piece of lint, dipped in a solution of nitrate of silver, eight grains to the ounce of distilled water, and over this a bran poultice. In most cases, however, it is better to foment the part well and then apply the tincture of arnica neat.

A BRUISE on a thin sole will sometimes cause matter to form, in which case the horn must be cut away, and the case treated as

for quittor. Before matter forms, the horn should be reduced, and the foot should be placed in a cold bran poultice.

CHAPTER VII.

CONSTITUTIONAL DISEASES.

Fevers—Anasarca—Glanders—Farcy.

FEVERS.

THE HORSE is very rarely subject to fever as a disease of itself, independently of inflammation, under which head I have already described catarrhal fever, both of the simple kind and when epidemic, and known as influenza. Indeed, all the important inflammations of the body are attended with fever; but in them the local affections are evidently more serious than the general disturbance of the system, which we call by the name of fever. By many veterinarians it is doubted whether fever ever shows itself in the horse without inflammation; but occasionally it may be observed under the form of simple fever, presenting all the symptoms which accompany ordinary inflammation, but without any such complication, and more rarely of the typhoid form, which now sometimes attends influenza and other epidemics.

SIMPLE FEVER shows itself by dulness and reluctance to move, a staring coat, and cold legs and feet, with increased warmth of the body. The pulse is quick, soft, and variable—breathing a little accelerated, but not much—appetite entirely lost—bowels confined, and urine scanty. These symptoms continue for two or three days, and then either go on into the typhoid form, or they are complicated by inflammation in some organ of the body. The *treatment* merely consists in giving a mild dose of physic, followed by a febrifuge drink, such as the following:—

Take of Spirit of Nitrous Ether	1 oz.
Nitre	3 to 5 drachms.
Tincture of Ginger	2 drachms.
Camphor Mixture	6 oz.

Mix, and give twice a day.

TYPHOID FEVER sometimes appears as an epidemic, occurring either as a sequel to influenza, or in its pure form, without any

complication The latter condition is, however, extremely rare. In its early stage, it can scarcely be recognised or distinguished from simple fever; but in the course of two or three days the strength is so much reduced, the breath is so fetid, and the mouth is loaded with such a black discharge from the tongue and gums, that the nature of the disease is clearly manifested. The pulse is very low, the languor increases, and there is often more or less delirium. The course of the disease is extremely rapid, and in five or six days a strong horse will sink beneath its powers, refusing food, and dying without any attempt to rally. The *treatment* should be of the most generous kind, as soon as the bowels have been gently moved, which should be effected, if possible, by injection. Then give a ball two or three times a day, composed thus:—

Take of Carbonate of Ammonia	$\frac{1}{2}$ to 1 drachm.
Powdered Ginger	1 drachm.
Powdered Yellow Bark	3 drachms.
Syrup enough to make into a ball.	

This should be washed down with a quart of ale caudle, and hay tea should be allowed as the drink *ad libitum*; or, if there is diarrhœa, rice-water may be used in the same way. Few cases, however, will recover, in spite of every exertion and careful treatment on the part of the attendant.

ANASARCA.

ANASARCA, OR MOOR-ILL, occurs chiefly among horses turned out in marshes or low commons, and may readily be known by the general swelling of the body, increasing by gravitation in the legs during the standing posture, but showing itself chiefly in the lower side of the body in the early morning, when the horse has been lying down all night. The disease is now rare, but it occasionally appears under the circumstances above described. The *treatment* must be by acting on the kidneys, the following being a useful recipe for the purpose:—

Take of Nitre	4 drachms.
Powdered Resin	3 drachms.
Ginger	1 drachm.
Spirit of Nitrous Ether	$1\frac{1}{2}$ oz.
Warm Water	2 pints.
Mix and give as a drench every night.	

GLANDERS.

THIS FRIGHTFUL CONSTITUTIONAL DISEASE appears to consist in the generation of some poisonous matter in the blood, which nature attempts to throw off by establishing a discharge in the nostrils. It is perfectly incurable, and therefore it is only neces-

sary to study its *symptoms*, with a view to distinguish it from ozena, with which alone it is liable to be confounded. Its chronic character and insidious onset will serve to distinguish it from catarrh and strangles.*

AT ITS COMMENCEMENT, it seems to be confined to the internal lining of the nostrils, which is not reddened, as in chronic catarrh (ozena), but presents a leaden or purple colour, sometimes of a deep shade, but at first generally very light and pale. This is accompanied by a thin acrid discharge, transparent, and without odor. Generally, one nostril only is affected, which in this country is more frequently the left, and in France the right; but why this should be so has never yet been even conjectured with any appearance of probability. This state of things usually only lasts for a few weeks, but it may go on for an indefinite time, and is recognised as the first stage; during which the health does not suffer, and the horse can, and often does, go on with his ordinary work. It may be distinguished from ozena by the purple color of the lining membrane, and by the transparency and freedom from smell of the discharge.

IN THE SECOND STAGE, the discharge increases in quantity, and though still watery and transparent, it is slightly sticky, indicating the presence of mucus. The lymphatic glands below the jaw enlarge, and become adherent to the bone, feeling hard to the touch, and almost like exostosis. Here the permanent character of the discharge and the adherence of the glands to the bone are the diagnostic signs from ozena.

IN THE THIRD STAGE, the discharge increases rapidly, and becomes yellow and opaque—in fact, it is pure pus. If the nose is carefully examined, its lining membrane will be seen to present one or more sores, with depressed centres and ragged edges, and surrounded by small varicose vessels leading to them from all directions. In proportion to the extent of the local mischief, constitutional disturbance is displayed. The appetite fails—the horse loses flesh and spirits—the coat is turned the wrong way—the skin is hidebound, and the legs fill slightly during the day, but go down at night—the nose is, at last, frightfully ulcerated, the sores spreading to the larynx—ulcers break out on the body—and the horse finally dies, worn to a skeleton.

When the diagnosis of the disease is confirmed, as it is undoubtedly highly contagious, both to other horses and to man himself, the patient ought to be destroyed. By the use of green food, his life may be prolonged for a time, and a certain amount of work may be got out of him; but the risk of contagion is too great to be incurred, and no man who regards his own welfare, and that of his neighbors, should keep a glandered horse.

FARCY.

THIS DISEASE appears to depend upon the development of the same poison as in glanders; but the attempt at elimination is made in the skin, instead of the mucous membrane lining the nose. A horse inoculated with glanders may exhibit farcy, and *vice versâ*; so that the essence of the disease is the same, but its seat is a different tissue.

FARCY usually shows itself first by one or two small hard knots in the skin, called "farcy buds." These soon soften, and contain a small quantity of pus; but as this is rapidly absorbed, the lymphatics which convey it into the circulation inflame; and at a short distance another bud is formed, and then another, and another. These buds are usually met with in the thin skin covering the inside of the thighs and arms, or the neck and lips. They vary from the size of a shilling to that of a half-crown; and as they increase in numbers, the skin becomes œdematous. In process of time, the general system suffers, as in glanders, and the horse dies, a miserable, worn-out object. No *treatment* can be relied on to cure the disease; and as it is equally contagious with glanders, every farcied horse ought at once to be destroyed. The hard nature of the buds, and the thickened lymphatics extending like cords between, clearly make known the nature of the disease

CHAPTER VIII.

SHOEING.

THE art of shoeing appears to have been unknown to the ancients, although the need of it was greatly felt, especially in the rough campaigning and long marches constantly recurring in those warlike times. In several campaigns the cavalry was rendered worthless and was disbanded on account of the bad condition of their horses' feet, and the animals themselves were relieved from duty until their hoofs were restored. The value of a horse depended more upon the soundness and strength of his hoof than upon any other qualification, and various methods of rendering it harder and more serviceable were proposed by Xenophon and other early writers. But while acknowledging the importance of a sound, vigorous hoof, and striving to harden and preserve it, it does not seem to have occurred to them to protect it by fastening to it by nails, a band or shoe of iron, although Beckman states that horse shoes and nails have been found in the graves of some German and Vandal tribes of unknown antiquity in the northern part of Germany. To William the Conqueror tradition ascribes the introduction of the practice of shoeing into England, whence it has remained until the present time.

When the delicacy of organization of the foot of the horse is considered, its extreme sensitiveness and wonderful adaptability for the purpose of locomotion, the enormous wear and tear incident upon constant use in the service of man, its liability to abuse and injury, and the consequent suffering of the dumb animal and pecuniary loss to the owner, it is surprising that there has been so little real improvement in the art. While the past half century has been so fruitful of results in almost every other branch of industry, it has witnessed few or none in this. This is due in great measure to the indifference of the artisan to whom the care of the horse's foot is committed, who, ignorant of the nature and structure of the living member before him, so recklessly handles and mutilates it, in much the same manner as his ancestors years before him.

The feet of most of the horses of the present day, and especially those used for drafty purposes and heavy work in our large cities, are in bad condition, and more subjects are brought to the knack

er's yard from this cause than all others combined. A healthy, vigorous foot is the exception even among horses used for lighter work. Brittle, shelly hoofs, ridged and dished, indicating internal derangement, withered frogs with the centre arch or stay entirely absorbed, high heels bound up by hard, unyielding crust, all these deformities and many others are chargeable in some degree to bad shoeing. Sometimes injuries are attributed to the blacksmith that are due to accident or brutality of the driver, but in as far as our system of shoeing interferes with the natural functions of the foot, it will induce disease.

The question then presents itself, Why not teach the mechanic the design of the structure, to the repair of which his lifetime is devoted? You may command him to treat your horse as you direct, but you must convince his judgment, if you expect obedience at all times; as well dictate to a physician what medicines he shall give your child at some stages of disease, and depend on him at others; he will treat the case in his own way, or not at all; the head, heart and hand must accord to make perfect work.

Our public schools have been a great power in the advancement of the mechanical arts; much of the labor-saving machinery now building up great wealth in the country, is the fruit of the philosophical truths there disseminated, and the improved social condition of the laboring classes is due to their influence. We have schools of science, and colleges for the instruction of students in the treatment and cure of horses, yet we expect those whose daily business is to perform important surgical operations upon a delicately organized member, to be reasonably successful, without having learned the alphabet of their profession. There are among them, individuals, intelligent and ingenious, who would be glad of an opportunity of testing the validity of their practice by an appeal to the condition of the hidden springs, levers, pulleys, cushions, and powers comprising the mechanism of the feet and legs explained by those who have made such their lifelong study. Many of these have, by long experience, discovered for themselves a fair system of shoeing, and are successful in the treatment and prevention of injury, but, ignorant of physiology, are unable to transmit their knowledge to others with sufficient reason to establish its truth.

To such fully educated to their profession, we must look for improvement in the art, and we hope that the day is not far distant when America may be able to boast of her veterinary colleges and schools for farriers, as of her other institutions of learning.

A small proportion of the pecuniary loss annually sustained in our large cities alone, would support such an institution, the good results of which would be incalculable. But while all thinking men admit the benefits which must result from its establishment,

it is too customary to regard the idea as visionary and impracticable, and maintain that the craft would not avail themselves of its advantages.

At first, doubtless, only the most intelligent would do so, but these, applying the theoretical knowledge received there to the commonest details and every-day experience of the smithy, would convince the most unreasoning that labor, when directed by skill and judgment, is more saving of money, strength, and material, than when unenlightened and unreasoning; and soon public opinion would force their more ignorant brethren to follow their example. A great painter was once asked how he mixed his colors. "With brains, sir," was the apt reply. When this is the rule and not the exception, we may indeed look for decided improvement in the art, the dumb animal be relieved of much suffering, and the community from unnecessary loss.

Veterinarians may propose theories, but lack the practical experience and opportunity of observation which the workmen alone can have, while the number of the latter who have combined scientific education with a thorough knowledge of the details of their profession, has been too small to stamp any decided character upon it.

With but very few exceptions the entire literature of shoeing is European, and to these writers the American public is indebted for all knowledge outside of that which an inquiring mind will gather from individual observation.

If horse owners would resort to the books for physiological facts, study their own horses, and use their own judgment, they would in most cases discover the best style of shoeing for their particular use.

Countries and sections differ greatly in the fashion of horse-shoes, and the manner of fitting them to the foot, but the general principles are the same.

We do not pretend to advocate any particular form of shoe, nail, or system of shoeing as an ultimatum of success, but wish to draw the attention of horse owners to the importance of the subject, that they may judge for themselves, the practice best suited to their own animals, and may arrive at a more accurate conception and a better appreciation of the hazard of a sole dependence on the general ignorance of blacksmiths.

A careful study of the construction of the foot, as explained in this work, will show the necessity of great caution and intelligence in its treatment; more than is usually displayed by our mechanics. This will be better understood by a reference to the member itself by dissection, which is practicable to most farmers, as they may frequently obtain specimens in their vicinity, and are possessed of the facilities for examination.

Sever the foot at the upper joint of the pastern bone, trace the veins, arteries and tendons, as suggested by the description; note the principal resistant parts affected by locomotion, the position of the coronary bone and its inclination within the hoof (not as frequently engraved entirely without or above it, and vertical when at rest), the navicular bone and joint, the tendons and sheath, with the action of each, the elastic property of the fatty heels, the tough, springy frog, its shape and position, the structure of the coffin bone, sole, crust and bars, and their mutual relations. Let the examination be careful, and guided by reflection, with due regard to each particular hoof, fore and hind, near and off, and condition of health. Form no hasty conclusions from partial investigations, and study for practical benefit, not for a show of wisdom. A wooden vice, butcher's saw, chisel, knives and nippers, are about all the instruments necessary, and after becoming acquainted with the natural tone of the crust, the operation may be facilitated by the use of warm water to soften the horn.

If this has excited an interest in the subject, let the student experiment with the shoeing of his own horses, young and old; having the entire control and supervision of their working, driving, stabling, pasturing and shoeing, he must learn something, if but his own ignorance. If resident of a country of light sandy soil, and the nature of the work will allow, the hind feet, if not all, might be left unshod to illustrate natural development; we have seen such with hard glossy hoofs, that could travel over turnpike roads with a light load, without breaking the crust or flinching on the frog.

The detail of horse-shoeing has been subjected to such adverse teachings by different authors (many of whom have but repeated palpable errors of their predecessors without attempt at originality), that it would be impossible to produce positive rules that will not meet with opposition, but the indications of disease, may be related without assigning their particular cause, of which there is much difference of opinion and uncertainty.

The conditions of a good, sound foot as apparent, are a smooth, glossy, resilient crust, almost circular were it continued around at the bars, but fuller on the outside quarter, which difference is seldom seen on a foot that has been shod a dozen times; a concave sole not too dry and hard; a full frog elastic throughout, with its centre or frog stay complete; heels sufficiently low and free from crust to bear their share of the springiness of action, and full and well developed to allow freedom to the bones and tendons in their movements. In horses the general rule is that dark hoofs are harder than light ones. The internal organization is in conformity with the external, the healthy state has been already described under the heads of bones, muscles, &c. In disease, we find within a concave, furrowed crust, the elastic process or bed of the same

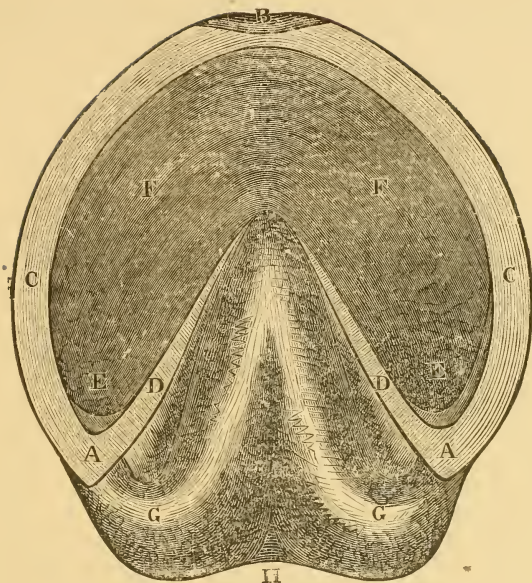


FIG. 20.—A SOUND FORE FOOT PREPARED FOR THE SHOE.

- | | |
|---|---|
| A. The heel of the crust. | E E. The angles between the heels and bars. |
| B. The toe. | where corns appear. |
| C C. The quarters of the crust. | F F. The concave surface. |
| D D. The bars as they should be left with | G G. The bulbous heels. |
| frog between them. | H. Cleft. |

form, and a dished coffin bone; under a convex sole a coffin bone turned up in front by absorption and flattened like the hoof, spongy and deficient in bony matter, the sensible sole diminished and the horny sole increased in substance; in long-standing cases of contracted heels, the interior organizations are alike reduced. Which-ever may be the primary change, internal or external, or whether either be a result of bad shoeing, no satisfactory solution has yet been given. Veterinarians wrangle over their favorite theories, charge one another with causing the diseases they profess to prevent, and are so completely antagonistic in their doctrines, that the public cannot be confident of truth, in implicit reliance upon the assertions of any.

In comparing the horse's foot with the human, we must be careful not to fall into error; their relations to the body are the same, but to understand the comparative structures, we must imagine ourselves upon all fours, resting upon the finger and toe nails, our

wrist and heel corresponding to the knee and hock-joints of the horse, though the bones are of different relative lengths and shape. The crust of the hoof is secreted in much the same manner as our nails, and growing downwards, or towards the extremities, slides over a laminated and highly sensitive bed, which, when injured, produces intense pain, on account of the unyielding nature of the crust, and the swelling consequent to inflammation. We may then realize the suffering produced by the prick of a horse-shoe nail under a horn so much thicker than our finger or toe nails.

As qualifications of resistance, and ease to superincumbent structures, we have, of the human foot, the main arch of the soles (which must be taken together to establish their completeness), and the transverse arch of the ball of the foot, displayed when the toes are brought to the ground. Of the horse there is the arch of the sole, and those formed by the heels and frog. The sole and coffin bone of the mule are more concave than those of the horse.

As propellers and levers, we find the same action from heel to toe, as the body moves forward in progression. The horse having two sets of levers, one for the fore part of the body and one for the hind, all working in connection, must make exactly the same length of step with each foot to avoid interference. From this fact, we account for a frequent cause of forging and stumbling. Both horse and man accustom the motion of the body to the length of step; if we then attempt to walk in a pair of shoes so much shorter than usual, as to cramp the toes and shorten the foot, we will be unable to carry the body as far with each motion from heel to toe, to correspond with our ordinary forward spring of the body; the tendency, therefore (until we learn better), is to a short, quick, stumbling gait. Now, take a horse whose hoofs have been slowly growing in length for a month, every motion of his body trained to accord, pull off his shoes, which will be found (owing to the forward growth of the hoof) farther from the heels than when first applied, pare away the crust down to the sole, cut out a big notch at the toe for a clip, set the new shoe back within the front of the foot (more on the fore feet, as they are supposed to grow faster), then rasp off the outer part of the toe back to the shoes, and clench the nails as tight as possible. This is a common mode of shoeing; his shoes are too small for him; he swings into a trot with the usual body motion, but the feet, all shortened, fail their part, while the fore feet, diminished more than the hind, are not thrown out quite as far, and the horse, unaccustomed to the change, dwells too long on them to escape a blow from behind. Weariness and laziness will also cause forging, by a tardy movement in front, and stumbling, by a failure to raise the toe sufficiently to avoid scrubbing the ground when thrown forward.

It is too common, especially in cities, among draught-horses, to

use up the lower part of the crust too fast for its growth. If the human finger-nail be pierced with a fine needle in the manner of a horse-shoe nail driven through the crust of a hoof, it will be observed that the hole will remain, until the growth of the nail has carried it beyond the flesh; that is, the fibres of horn once separated will never unite. Horses used for heavy work are shod with heavy shoes, thick toe and quarter clips, high calks and steel toes, and either because of the severe strain on the stones, the weight of the shoes and nails, the leverage of calks and toes, waste of crust to accommodate clips, or of all combined, they require shoeing about once in three weeks, and frequently oftener. At each shoeing, a little more crust and sole is taken off of the ground surface, a few more holes made (or nails driven into old ones, enlarging the aperture by working about and bending under the clenching iron). The surface of the crust is again rasped, diminishing the thickness, new furrows made to accommodate the clenches, and the horn burned and softened by a hot shoe each time. The blacksmith will insist that all these operations are necessary, but the fact is, he is using up material too fast, and we leave it to horse owners to judge by experiment, how these operations may be modified. The French method of bringing the points of the nails out low down on the surface of the hoof, appears rational, as it destroys the vitality of the crust to a less degree than our custom, and leaves a greater proportion of sound foot to bear the shocks.

Our practice has been, after removing the old shoes (with care not to enlarge the old holes by dragging crooked nails through them), to pare off the crust and bars well down to the outer edge of the sole, without taking a shaving from the sole, frog, or inside

of the bars. If the crust has not been broken by wear, this leaves the foot as near its natural shape as possible, and a shoe must be made to fit it. For roadsters, a narrow, light shoe is fitted to the crust in length and width, then made perfectly level, without twist or pritchell burs at the nail holes, and while sufficiently hot, slightly



SHOEING.

touched to the crust, to mark any inequalities that may have been left after paring. Six nails are used, three on each side, dividing the space from about an inch from the centre of the toe, to the centre of the quarters. The nail holes are set well back from the outside edge, and made straight through the iron; the rails are

small, smoothed off with the hammer, and slightly bevelled on one side of the point; the position of the holes in the shoe brings the nails out low down on the surface of the crust, but care must be taken to start them in the centre of the holes, that the foot may not be cramped or forced out of its natural shape. The projecting nail points are filed close to the hoof, that they may be broken off without twisting the nail, or enlarging the hole in the crust; the nails are then driven up, and the clenches turned over and hammered down.

No rasp has been used, no crust wasted by mutilation for clips, and but little injury by nail holes; if the nails be of good iron, they are sufficient in number, and the light clenches on a sound foot, will hold the shoe perfectly tight, and will not cause abrasion of the legs in travelling.

The foot presents what we might call a beautiful fit, the tender part of the frog is protected by the thickness of the shoe, while as it is renewed from within, the outside will be worn off by friction, and nature will keep it exactly low enough to obtain its necessary exercise; moreover, by driving the nails straight through the middle of the hole in the shoe, the foot will be free from that disagreeable, cramped feeling, we have imagined a horse to experience, when the nails are started at either side of the hole in the iron, forcing the more yielding fibres of horn to its centre.

There have been many forms of shoes recommended by different authors, but few of which are used in this country. The French shoe has a convex ground surface, and the foot is fashioned to it, by leaving the quarters full, and the crust sloped off towards the toe and heels. Why the bearing should be taken off the heels we cannot imagine, and forcing the quarters to bear an undue amount of concussion would apparently induce quarter crack, but having had no experience with this shoe we may be wrong in our conclusions.

Another fashion imitates an old shoe worn off at the toe, which is certainly an advantage to roadsters, as it would be to us, if we could buy new shoes to fit our feet exactly like the old ones. Some writers advocate nailing the shoe only upon the outside quarter, or with but two nails on the inside, toward the toe, with the idea of allowing unimpeded expansion of the crust when the foot strikes the ground. Inasmuch as nails injure the crust, the practice of using as few as possible is wise, but we have been unable to discover any expansion of the anterior half of the ground surface in hocks that have never been shod. A careful examination will convince any one that there is no mechanical necessity for such spreading, and from the nature of the organization of the foot, it is simply impossible; all the spring needful to the front of the crust is gained by the elasticity of its fibres. The line of bearing of the lower part of the fore leg,

is directed behind the centre of the foot, and the yielding points of the framework are the pastern, coronary and navicular joints; as the upper part of the coronary bone works backward and downward, it, with the action of the tendon, slightly spreads the heels laterally, and the whole crust partakes of the movement, diminishing in effect towards the toe; were the foot completely inelastic, the motion might be detected at the quarters, but the whole of a healthy foot is of a yielding nature; the fatty heels, in particular, may be compressed like cork, while the frog resembles a piece of india-rubber, and there is a spring in every fibre of the crust. These conditions so far distribute motion, that there is practically none in the ground surface of the crust forward of the centre.

From the fact of this style of shoe allowing free expansion, its advocates proclaim it a preventive of contracted heels (which, unfortunately, is so prevalent among shod horses); but if, as we suppose, there be no spreading of the front part of the crust by pressure, a shoe nailed only at, and forward of the quarters, will not interfere with any natural movement of the heels.

This disease (contracted heels), which has been described on page 409, appears to be an absorption or waste of a portion of the frog and fatty heels, accompanied by an undue secretion of crust at the posterior part of the foot, encroaching upon the province of the softer tissue of the heels.

Many reasons have been assigned for this disturbance of the natural nutrition of the different parts, all or none of which may be correct, for no theory has yet been so clearly demonstrated and proven, as to leave the causes and nature of the disease beyond a doubt, but we have never known any tendency to contraction, in horses that have been shod in such manner as to allow the frog a fair amount of exercise, indicated by its position.

An india-rubber shoe intended to be used as a cushion between the iron and the foot, has been designed, patented and tried, within the last two or three years, but we believe has failed to give general satisfaction. The rubber mashes out in a short time by concussion, and leaves a loose shoe. Good sole leather is much more durable.

Until recently, the whole process of making the shoe was performed by hand, but now in the United States, the greater bulk is made by machinery, and at one immense establishment.

The manufactory of Messrs. Burden & Sons, at Troy, New York state, with its six forging machines, turns out six shoes per second, and in four years made twenty-five thousand tons; or calculating one and a half pounds to the shoe, thirty-seven million shoes. These shoes are of the very best iron, warranted to bend double cold, and to wear as long as any made by hand; the iron used in

their manufacture bearing a tensile strain of seventy-eight thousand pounds to the square inch.

The power of the factory is gained by a large stream of water, with a head of seventy-two feet, acting on an overshot wheel sixty feet in diameter, with buckets twenty-two feet long and six feet four inches deep, the whole wheel weighing over three hundred tons. Connected with the establishment is a horse-shoe museum, comprising many hundred specimens of shoes of all ages and all countries, collected together at much expense with a view to improvement upon the old types. There are now three different patterns manufactured, and they will furnish any other pattern desired, if ordered in sufficient quantities. The cost of the shoe to the blacksmith, is about a cent and a half per pound above the price of the iron.

Independent of the immense curtailment of expense, the advantage of machinery directed by one master mind over the old system, or rather want of system of individual effort and incongruous labor, is great; and it should be the aim of the manufacturer, as self-interest will dictate, to study and experiment to attain the most desirable pattern, in width of web, seating, fullering, position of nail holes, and quality of iron, and the mechanics will necessarily adopt his improvements.

In short, it should be an aim in shoeing a horse, as in man, to make a fit as neat and easy, and of as light material as would be adapted to its use, and experience has proven, that heavy shoes with high calks and toes, are not necessary for successful hauling over our city cobble stones, or hard roadways.

In this article we have given no positive directions for shoeing, judging the art in its present state too imperfect to satisfy this progressive age, but have sought rather to stimulate inquiry and experiment, that may lead to improvement in the system.



CHAPTER IX.

OPERATIONS.

Administration of Chloroform—Methods of confining the Horse—Bleeding—Firing—Setons and Rowels—Blistering—Castration—Docking and Nicking—Unnerving—Reduction of Hernia—Administration of Physic—Clysters—Back-Raking.

ADMINISTRATION OF CHLOROFORM.

THE USE OF CHLOROFORM to procure insensibility to pain is a great aid to the operator on the horse, who without it acts under great difficulties, owing to the nervous twitch which the poor animal gives at each touch of the knife. Under chloroform, however, he lies as if dead; and as long as its effects continue, the most elaborate dissection may be conducted with comparative ease. There is some little danger of overdoing this powerful agent, but the risk is not so great as is generally supposed, and with ordinary care it is more than one thousand to one that no injurious effects are produced.

THE BEST AND MOST SIMPLE APPARATUS for the purpose of administering chloroform is a common wire muzzle, to the upper edge of which a strip of leather six inches deep is stitched, and so arranged that it may be buckled round the upper part of the jaws. This insures that all the air inspired shall pass through the wires, and by covering them with a cap of very loose flannel, in which a few holes are cut to facilitate respiration, the muzzle may be made ready for use. The horse is first cast, after which the above apparatus is put on and buckled round the jaw, when on sprinkling the chloroform over the cap of flannel, it may be applied or removed in an instant, and the amount of anæsthesia regulated accordingly. Without some guard such as the wire affords, the chloroform runs over the nostrils and lips, and blisters them to a serious extent; but when it is used, such an accident can only occur from over-saturating the flannel. The necessary quantity of this powerful agent must be employed; but when once it is found that a prick of a pin or other pointed instrument is borne without shrinking, the flannel may be withdrawn, and the operation quickly commenced, taking care to have an assistant ready to put it on again if the horse shows signs of returning sensibility to pain. Six or eight ounces of chloroform must be provided, as the quantity required is rather uncertain, the average dose being about three or four ounces.

IF CASTING is objected to, either from the absence of hobbles, or from fear of injury to the horse, a soft bed of straw should be

provided, and a strong halter must be put over the muzzle with two cords, one of which should be held by a man on each side. These will serve to guide the horse in falling; but it is extremely difficult to make sure of his going down where he is wanted to lie; and there is also considerable time lost in securing him after he is down, which the safety of the operator imperatively requires. The effect of the chloroform must therefore be kept up for a much longer time than if it is given after the horse is cast and secured.

METHODS OF CONFINING THE HORSE.

THERE ARE VARIOUS PLANS adopted by veterinary surgeons to bind the horse's limbs, so that he cannot injure himself or them when undergoing an operation. Even when chloroform is employed, some coercion of this kind must generally be adopted, as directed in the last section; for if it is given in the standing position, the horse is very apt to injure himself in falling, which is often accompanied by powerful convulsive motions, and moreover he cannot with certainty be placed in a suitable position. The plan adopted by Mr. Rarey is seldom suitable, because it can only be employed on subjects previously taught to go down without assistance, for the severe struggle which the untaught horse makes before he submits is calculated to produce injurious constitutional disturbance, and, moreover, it would sadly increase any of the various diseases of the limbs for which operations are so often performed. Sometimes, however, it might advantageously be introduced into veterinary surgery, as for instance in castration, when the colt will not suffer his hind legs to be touched, but even then it will be necessary to throw him two or three times, or he will be in such a state of arterial excitement that inflammation will be likely to follow. The usual methods of confinement are: 1st. The hobbles. 2d. The side line. 3d. The trevis, or break. 4th. The twitch and barnacles.

HOBBOLES consist of four broad padded leather straps, provided with strong buckles, and long enough to encircle the pasterns. To each of these an iron ring is stitched, and to one of them a strong soft rope, six yards in length, is securely attached. Provided with four, or, if possible, five assistants, the operator buckles the hobble with the rope attached to the near fore leg, and the remaining three to the other legs. Then passing the rope through their rings, and through the first also, it is held by three assistants, the nearest of whom stands about a yard from the horse, so as to pull upwards as well as away from him; a fourth assistant holds him by the head to keep him quiet, and to be ready to fall on it as soon as he is down, and the fifth stands at his quarters, ready to push him over on his off side. This place is sometimes occupied by the operator himself when he is short of hands. Casting should never

be attempted on any hard surface, a thick bed of straw being necessary to prevent injury from the heavy fall which takes place. The hind legs should be brought as far forward as possible before beginning to pull the rope, and when the men do this they should do it "with a will," but without jerking, so as to take the horse off his guard, when he will resist much less stoutly than if he is allowed more time. As soon as the legs are drawn up together, the man at the quarters is quite safe from injury, and he may lean forcibly against that part, and force the horse over to the off side, upon which he falls: the assistant at the head keeping that part down, no further struggling takes place, and he is secured by passing the end of the rope under the hobble rings between the fore and hind legs, and securing it with a hitch. Something more, however, is necessary to be done before any of the usual operations can be performed, as all of the legs are at liberty to a certain extent and the scrotum cannot be reached in safety. The following further precautions must therefore be taken, varying according to the part to be operated on.

FOR CASTRATION the horse should be cast on his near side, with a web halter in the usual place of a collar. The rope of the halter is then passed through the ring of the hobble on the off hind leg, and using it as a pulley the foot is drawn forcibly forward beyond the arm and firmly secured to the webbing round the neck, and bringing it back again it may be passed round the thigh above the hock (which should be guarded from friction by a soft cloth or leather), and again secured to the webbing. By these precautions the scrotum is completely exposed, and the hind legs cannot be stirred beyond the slight spasmodic twitch which extends to the whole body.

TO PERFORM ANY OPERATION ON THE FORE LEG, it must be taken out of its hobble, and drawn forward upon the straw by a webbing attached to its pastern, where it must be held by an assistant, the horse having little or no power over it in this position.

THE HIND LEG IS SECURED in the same way as for castration, unless the fetlock is to be fired, when webbing must be applied to the thigh above the hock only. With most horses, however, firing can be performed without casting, by buckling up the fore leg, or by having it held by a competent assistant.

WHEN THE HORSE is to be released, the hobbles are quietly unbuckled in succession, beginning with the undermost hind leg.

SEVERAL IMPROVED HOBBLER have been invented, but they are suited rather for the veterinary surgeon than for the ordinary horsemaster, who will only require them for castration and minor operations.

THE SIDE LINE is sometimes used for securing one hind leg thus:—the long rope and single hobble only are required, the lat-

ter being buckled to the hind pastern, which is to be secured. The rope is then passed over the withers and brought back round the bosom and shoulder of the same side as the leg to which it is secured, and then passed inside the first part of the rope. By pulling at the end of this cord the hind leg is drawn up to the shoulder, and secured there with a hitch, but the plan is not nearly so safe as casting.

THE TREVIS OR BREAK consists of four strong posts driven into the ground, at the corners of a space six feet long by three feet wide. They are strongly braced together by wooden stays, three feet six inches from the ground on three sides, the fourth being left open for the horse to enter, after which this also is made good by a padded bar passed through stout iron rings fixed at three feet from the ground to the uprights. By means of this framework, to which sundry rings are bolted, the body of the horse is first securely confined by two broad bands under the belly and two above the shoulders and croup. Thus he can neither rear nor kick to any extent sufficient to free himself, and all that is necessary is to lay hold of any limb selected for operation, and confine it to one of the uprights, or to some other convenient point. This is the best plan to be adopted for firing and other operations on the legs, and if the belly-bands are wide, strong, and secure, chloroform may be administered in it, without the horse going down.

THE TWITCH is a short stick of strong ash, about the size of a mopstick, with a hole pierced near the end, through which is passed a piece of strong but small cord, and tied in a loop large enough to admit the open hand freely. This is passed over the upper lip close to the nostrils, and then, by twisting the stick, compression is made to a painful extent, which will keep horses quiet for any slight operation. Sometimes it is placed on the ear in preference, but in either case the effect is dependent on the pain produced.

BARNACLES consist in the application of pressure by means of the handles of a pair of pincers enclosing the muzzle, and held firmly by an assistant. They are, however, not so useful as the twitch.

BLEEDING.

IN THE EARLY PART OF THE PRESENT CENTURY bleeding was resorted to on every appearance of the slightest inflammation, and often without the slightest necessity. Many horses were regularly bled "every spring and fall," to prevent mischief, as was supposed; but at last it always happened to every horse which lived long enough, that the more frequently blood was taken the more the operation was required, and when it was absolutely wanted to lower the heart's action, such a quantity of blood must be taken that the system was reduced to a dangerous degree. Stallions were

constantly submitted to this treatment, and mares as long as they were worked, so that in course of time it has happened to the horse, as it has also to man himself, that the horrible abuse of the lancet for two or three consecutive generations has completely changed the type of the diseases to which they are both subject. Inflammation does not now follow the same course that it used to do, but is of a much milder type, and the attendant fever is inclined to assume a typhoid character, if lowering measures are pushed to any great extent. An attempt has been made to account for this change in human diseases by the alteration in the habits of the present generation, which are certainly more temperate than those of the previous one; but in the case of the horse the reverse holds good, for he is now stimulated by more corn than ever. The only point, as far as I can make out, in which the horse and his master have been similarly maltreated, is in the abuse of the lancet, which undoubtedly may account for the change in the type of their diseases to which I have alluded, and it is, therefore, reasonable to refer it to this cause. But though this powerful agent has been thus abused, we must not be deterred from having recourse to it when severe inflammation occurs in the horse. Sometimes there is no time to wait for the effects of a slower remedy even if there is one which will be sufficiently powerful to control the heart's action. The only sensible plan in such case is to choose the lesser of the two evils, and to save life, or the integrity of the organ attacked, as the case may be, by abstracting blood, always remembering that this is to be avoided as long as it is safe to do so, but that when it is decided on, a sufficient quantity must be taken to produce a sensible effect, without which there is no attendant good to counterbalance the evil.

BLEEDING is either performed in the jugular vein, when the whole system is to be affected; or when a part of the body only is inflamed, it may be desirable to abstract blood locally, as for instance from the toe or from the plate vein, in inflammation of the foot, and in ophthalmia from the vein which lies on the face just below the eye.

THE INSTRUMENTS USED are either the lancet or the fleam, the former being the safer of the two, but requiring some practice to manage it properly. In bleeding from the jugular vein a string is sometimes tied round the neck below the part to be opened, which is four or five inches below the fork in the vein in the upper part of the neck. The skilled operator, however, makes pressure with his left hand answer the purpose of causing the vein to rise, and during this state either uses the lancet with his right or the fleam with the aid afforded by the blow of a short stick, called a "blood stick." When the blood begins to flow, the edge of the bucket which catches it is pressed against the same part, and as

long as this is continued a full stream will run until faintness occurs. After sufficient blood has been taken, the two lips of the wound are raised between the fingers, and a *small* common pin passed through both, when the point is cut off and some tow is twisted round, by which the edges are kept together and the pin is retained in position. In a couple of days the pin may be withdrawn without disturbing the tow, and the wound will heal with little or no deformity. Sometimes the blood continues to flow beneath the skin after it is pinned, and a swelling takes place in consequence, which is called ecchymosis. When this happens, cold water should be freely applied and the head kept up by racking to the manger.

THE QUANTITY OF BLOOD necessary to be taken will vary according to circumstances, and can scarcely be fixed from the appearance of the blood drawn, but a repetition of the operation may be decided on if the clot of the blood, after standing, is very concave at the top (cupped), or if it is very yellow (buffed), and especially if both these signs are present. In inflammation of a severe character less than six quarts of blood will seldom lower the pulse sufficiently to be of much service, and sometimes seven or eight quarts even must be taken from a large plethoric animal.

INFLAMMATION OF THE VEIN will sometimes supervene upon bleeding, the *symptoms* being a slight swelling appearing in the evening, or the next day, with a little oozing from the wound. These are soon followed by a hard cord-like enlargement of the vein, which feels hot to the touch, and the parts at the angle of the jaw swell considerably. The consequence generally is that the vein is obliterated, occasioning some disturbance to the circulation, especially when the head is held down, as it is at grass. The *treatment* consists in cold applications as long as there is heat, the lotion recommended at page 316 being generally useful. When the heat has subsided, and the vein remains enlarged, the biniodide of mercury will procure the absorption of the new deposit, by rubbing it in as recommended at page 300.

FIRING.

THE PURPOSE for which the heated iron is employed is twofold; first, to produce immediate counter-irritation, by which the previous inflammation is reduced; and secondly, to cause the formation of a tight compress over the part, which lasts for some months. It is the fashion to deny the existence of the latter effect of this operation; but every practical man must be aware that it follows

upon firing to a greater or less extent, according to circumstances, but always lasting for a few months, until the skin stretches to its previous condition. The blemish which it leaves, and the pain which it occasions, both during and after the application of the irons, should cause it to be avoided when any equally useful substitute can be employed; but, unfortunately, there are many cases where it stands without a rival, as being at once the safest and the most efficient remedy which can be adopted. Blisters and setons can be made to cause the same amount of counter-irritation; but the inflammation accompanying the former often extends beneath the skin, and increases the mischief it was intended to relieve; while the latter has no effect whatever in producing pressure upon the parts beneath. The pain of firing can be relieved entirely at the time of the operation by chloroform; but the subsequent smarting is quite as bad, and this is beyond the reach of any anæsthetic. Independently, however, of the interests of the master, it is also to the advantage of the horse to get thoroughly cured; for if he is not, he will either work on in misery, or he will be consigned to the knacker's yard; and, therefore, the adoption of the most efficacious plan of treatment, even if somewhat the most painful, is the best for both.

FIRING MAY BE PERFORMED STANDING, by the use of the side line for the hind leg, or by fixing up one fore leg when the other is to be operated on. There is, however, nothing like the break or trevis, where more than a slight extent of surface is to be lined. The firing-iron should have a smooth edge, about the thickness of a worn shilling; and it should be heated to the point when it shows a dull red in the dark. When the disease for which the irons are used is slight, the skin should not be penetrated; but in bad cases, where the mischief is great, and particularly when it is wanted to have a good permanent bandage, the cauterization must be deeper; but this requires some practical knowledge to decide. The hair of the part should be cut very closely with the scissors, or shaved; then, having secured the leg, the iron is to be steadily but rapidly passed in parallel lines over the skin, making just the proper pressure which is required to burn to the requisite depth. A light brown mark should be left, which shows that the proper effect has been produced; and the color should be uniform, unless it is desired to penetrate deeper at certain parts, which is sometimes practised with advantage. The lines are sometimes made in a slanting direction round the leg, and at others straight up and down; but it is useless to describe the details of this operation, which *can* only be learned by watching its performance by another hand. Badly done firing is always an eyesore; but when the lines are evenly drawn, and they have healed without any sloughs, caused by irregular or excessive pressure, they show that a master-

hand has been at work, and that the poor beast has been treated scientifically. In very severe diseases, a blister is sometimes applied over the part, immediately after the firing; but this can seldom be required, and as it aggravates the pain tenfold, it should be avoided, if possible. On the following day, a little neat's-foot oil should be gently rubbed, or brushed with a feather, over the leg; and this should be repeated daily, until the swelling which comes on has nearly subsided. Less than three months' rest should never be allowed for the operation to have its full effect, as, if the horse is put to work before that time has elapsed, the disease will almost certainly return. Indeed, it is far better to allow double this time, especially if the horse is wanted for fast work.

SETONS AND ROWELS.

SETONS are pieces of tape or lamp cotton, passed through and beneath the skin, leaving the two ends hanging out, either tied together or with a knot upon each. The latter is the safer plan, as the loop is always liable to be caught on a hook or other projecting body. The needle with which the passage is effected has a spear point, slightly turned up, and an eye at the other end (see fig. 22), through which the tape or cotton is threaded. The

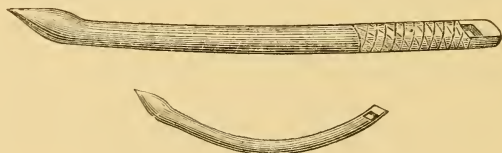


FIG. 22.—SETON NEEDLES ONE QUARTER SIZE.

ordinary one is about nine or ten inches long, and by its means a tape or piece of lamp cotton, smeared with blister cerate, may be passed through a long track of the cellular membrane, by pinching up the skin into a fold, and piercing this close to the body with the needle, which is then to be carried straight through. On drawing the tape out of the eye, it must be tied in a large knot at each end, which will prevent its slipping out. In three or four days, a profuse discharge will come on, and it must be kept up, if necessary, by repeated applications of blister cerate, or digestive ointment, as may be necessary. The ends should be sponged occasionally, to remove the accumulated matter.

A SMALLER CURVED NEEDLE, about five or six inches long (see lower figure, 22) is used for introducing a seton into the frog, or beneath the eye. For the former operation, a twitch is first applied, and the foot is then buckled up to the arm, as described at page 167. The needle then, armed with the tape, greased with

blister cerate, and a little oil to lubricate the surface, is thrust in at the heel and out at the cleft of the frog, taking care not to go deep enough to wound the tendon as it passes over the navicular bone. The needle is then forcibly drawn through, and the tape knotted, as already described. The openings must be kept clean by sponging daily; and in three or four weeks the tape will have nearly worked its way out, when it may be withdrawn.

ROWELS are now seldom employed, being very unmanageable plans for causing counter-irritation. An incision, about an inch long, is made in the skin, selecting a part where it is loosely attached, and into this a blunt instrument, called a "cornet," is pushed, and worked about in all directions, until the skin is separated from the subjacent parts for a circle with a diameter of from two to three inches. Into this a piece of thick leather of that diameter, with a hole in the middle, is inserted, previously having smeared it with blister cerate; and the part is then left to nature. In a few days, a discharge of matter comes on, which must be washed off occasionally; and in the course of time, the leather, if allowed, would find its way out by ulceration. Before, however, this takes place, it is generally removed.

BLISTERING.

WHEN IT IS DECIDED TO BLISTER any part, the hair should be cut off as closely as possible; the ointment is then rubbed in with the hand for ten minutes, leaving a good quantity smeared on the surface. If the legs are to be blistered, the heels should be protected by lard. Considerable itching is caused after the first two or three days, and many horses, if allowed, gnaw the part to such an extent as to cause a serious blemish. It is therefore necessary to keep the head away, which is done by putting a "cradle" on the neck. The irritation of loose straw is very aggravating, and the stall or box should either be bedded with tan, or sawdust, or with used litter, so damp as to lie smoothly. It is generally the practice to put the blistered horse on a bare floor; but he will often do great harm to his legs and feet (which are of course unsound, or they would not be treated in this way), by constantly stamping from the pain occasioned while the blister is beginning to rise. When the legs are stiff and sore from the swelling, he stands still enough, but at first there is nothing of this kind to keep him quiet. James's blister, which is very mild, and useful for trifling diseases of the legs, or for bringing on the hair after "broken knee," can generally be used without a cradle; but even with it, horses will sometimes gnaw themselves, and it is better not to run any risk. At the end of a week, some neat's-foot oil should be applied every morning, with a feather or soft brush, to keep the scabs as supple

as possible. The various formulas for blisters will be given in the list of *materia medica*.

CASTRATION.

FOR REMOVING THE TESTICLES several methods of operation have been proposed; but hitherto none has been tried which is so successful as the old plan, in which the division of the cord is performed by a heated iron with a sharp edge. In human surgery the spermatic artery is tied, and all danger of hemorrhage is over, because the small amount of bleeding which takes place from the artery of the cord is of no consequence, as it cannot enter the cavity of the peritoneum. In the horse, on the other hand, the inguinal canal communicates with that cavity, and if the ligature is used, there is a double danger of inflammation—first, from effused blood, and secondly, from the irritation of the ends of the ligature. This plan, therefore, is now generally abandoned, though some few practitioners still adhere to it, and the choice rests between two methods of removal by cautery, namely, the actual and potential,—the former giving more pain at the moment when the heated iron is applied, but the latter being really far more severe, as the caustic is a long time in effecting a complete death of the nerve and other sensitive parts. Torsion of the vessels has been also tried, but it is often followed by hæmorrhage, and, moreover, the pain which is caused during the twisting of the artery is apparently quite as great as is given by the heated iron. We are all inclined to fancy that fire occasions more agony than it really does, but those who have in their own persons been unfortunately able to compare the effects of the two kinds of cautery, have uniformly admitted that the actual is less severe than the potential, if the two are used so as to produce the same amount of cauterization.

THE BEST PERIOD FOR PERFORMING THE OPERATION on the foal is just before weaning, provided the weather is mild. If, however, his neck is very light, and the withers low, its postponement till the following spring will give a better chance for the development of these parts. The cold of winter and heat of summer are both prejudicial, and the months of April, May, September, or October should always be selected.

NO PREPARATION IS REQUIRED in the “sucker,” but after weaning the system always requires cooling by a dose of physic and light food before castration can safely be performed. Horses which have been in training, or other kind of work attended with high feeding, require at least three weeks’ or a month’s rest and lowering, by removing corn, mashing, &c., together with a couple of doses of physic, before they are fit to be castrated.

FOR THE ORDINARY METHOD OF OPERATING, a pair of clamps should be provided, lined at the surfaces where the compressor

is made, with thick layers of vulcanized india-rubber. This material gives a very firm hold without bruising the cord, and causing thereby inflammation. A large scalpel and a couple of irons will complete the list of instruments, over and above the apparatus necessary for casting the horse (see Casting, page 433). The horse being properly secured according to the directions there given, and a twitch being put on the lip in case he should struggle much, the

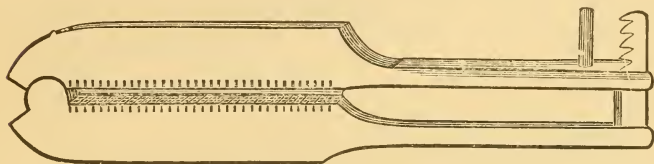


FIG. 23.—CLAMS LINED WITH VULCANIZED INDIA-RUBBER.

operator, kneeling on the left side, grasps the testicle so as to make the skin of the scrotum covering it quite tense. A longitudinal incision, about three inches long, is then made down to the testicle, which, if care has been taken that there is no rupture, may be rapidly done—a wound of its surface not being of the slightest consequence, and giving far less pain than the slow niggling dissection of its coverings, which is sometimes practised to avoid it. The testicle can now be cleared of its coverings, and the hand laying hold of it gently, the operator raises it from its bed, and slips the clams on each side the cord, at once making the proper pressure with them, which should be sufficient to prevent all risk of the part enclosed slipping from between its jaws. Great care should be taken that the whole of the testicle, including the epididimis, is external to the clams; and as soon as this is satisfactorily ascertained, the cord may be divided with the ordinary firing-iron at a red heat. To make sure that no hæmorrhage shall occur, some operators sear the artery separately with a pointed iron; but if the division is slowly made with the heated iron, and avoiding any drag upon the cord, no such accident will be at all likely to follow, though very rarely it will happen in spite of every care. The clams may now be removed, and the other testicle treated in the same way; after which the hobbles are cautiously removed, and the patient is placed in a roomy loose box, where he can take sufficient exercise to insure the gravitation of the discharge, but no more.

THE FRENCH PLAN, by means of caustic, requires two pieces of wood, each about six inches long and an inch square, with a notch or neck at each end, to hold the twine by which they are tied together, and a groove in the two opposite surfaces, to hold the caustic. This is composed of one part of corrosive sublimate and four of flour, made into a paste with water, and it is intro-

duced while moist into the grooves, which it should completely fill. The horse is then secured as before, the cord is exposed, the pieces of wood are adjusted on each side, and firmly held together with pincers by an assistant, while the operator binds their ends together with waxed string. The testicle may now be removed with the knife, if the string has been tied sufficiently tight; but unless the operator has had some experience, it is safer to let it remain on till it comes away by the ulceration of the cord. This is *the uncovered operation*, the *covered one* being performed with the same instruments, as follows. The scrotum is grasped, and opened, taking care to avoid wounding the tunica vaginalis reflexa, or *outer serous investment*, but cutting down to it through the skin, dartos muscle, and cellular membrane. These are to be carefully dissected back, until the cord can be isolated without wounding its serous investment (tunica vaginalis), which is so thin that it is easy to ascertain with certainty the nature of its contents by examination with the fingers. If there is no hernia, the caustic can at once be applied to its outside in the same way as before; and if there is, it must be pushed back into the cavity of the abdomen, by a little careful manipulation.

SOME VETERINARY SURGEONS operate in a similar way to one or other of the two last described plans, with the omission of the caustic, which they maintain is wholly unnecessary, for there *must* be sufficient pressure to cause a sloughing of the cord. There is certainly some truth in this argument, but if the pressure has not been sufficient to cause the sloughs, the caustic will assure that essential process, and thus it renders the operation safer, though it somewhat increases the subsequent local inflammation. The plan without caustic is almost precisely the same, as far as safety is concerned, as that formerly adopted by country farriers, called "twitching," in which two pieces of wood were applied on each side the base of the scrotum, and tied firmly at each end. The pain, however, occasioned by the pressure on so large a surface of skin is intense, and the operation is on that account indefensible, besides which it is not nearly so successful as either the ordinary English or French operations.

DOCKING AND NICKING.

THESE OPERATIONS ON THE TAIL are subject to the fashion of the day, the former being used for the purpose of shortening its length, which is inconvenient to the rider or driver in dirty weather, and the latter for altering its carriage, when this is too low for the taste of the owner. Nicking, is, however, very seldom practised in the present day, and never to the extent which was the fashion fifty years ago.

DOCKING is very rapidly performed by the aid of the docking-knife, which is made on the principle of the guillotine. As the tail is removed at one sudden and forcible chop, the horse need not be confined in any way beyond fixing up his fore leg, unless he

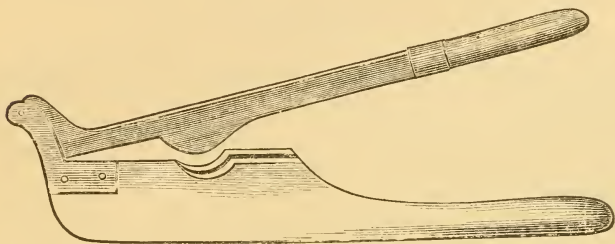


Fig. 25—DOCKING-KNIFE.

is a very violent animal, when he must be placed in the break (see page 435). The exact length of the dock to be left being fixed upon, the hair is cut off close below, and the remainder tied back to the root of the tail. The situation of the joint, which may be ascertained from its greater prominence, is then marked, by carefully removing the hair with the scissors, and then laying it in the rounded groove of the wooden frame in which the knife plays, so that the edge of the latter shall exactly correspond with the part to be cut, the handles are suddenly and forcibly brought together, and the end is removed at one blow. A pointed iron should have been previously heated, and then raising the tail to a level with the back, the arteries are first seared, which a very slight touch will effect, and then the point is pushed into the sheath of the tendons lying at the top of the stump, so as to cause them to adhere in that position, and effect a handsome carriage of the tail. Lastly, a little resin is melted over the end of the stump with the iron now pretty nearly cooled, and the operation is concluded by untying the hair.

NICKING was formerly carried to such an extent that the poor horse *could not* lower his tail, but was always obliged to carry it over his back. Several deep cross-cuts were made in the underside after being docked, and then a cord was fastened to the hair, and being carried over a pulley attached to the ceiling, the tail was kept drawn up over the back by a weight at its end. The horse could lie down by raising the weight, but by no possible means could he lower his tail, and in course of time the wounds healed by granulation filling up their spaces, and the nicking was completed. When a horse now carries his dock too low, a sub

cutaneous incision of the flexor tendons is made, which is generally sufficient, but if not the pulley is adopted for a few days. Sometimes the tail is carried on one side, and then a similar operation by subcutaneous division of the tendons on the side to which the tail is carried will have the desired effect, always taking care in each case to keep the knife clear of a joint.

UNNERVING.

THE NERVES distributed to the foot are sometimes divided for navicular disease, as they lie on each side of the bone above the fetlock joint. No one, however, should attempt this operation without having previously seen it performed, as it requires considerable dexterity for its due execution. I have described such operations as may be wanted in the parts of the country where a veterinary surgeon cannot always be reached, but unnerving is but seldom required, and I shall therefore omit any detailed account of it.

REDUCTION OF HERNIA.

HERNIA is sometimes strangulated; that is to say, the protruding portion of bowel is confined in its situation by such pressure on its neck as to cause danger of mortification. Under such circumstances, if it is found to be impossible to return the bowel by careful manipulation, an operation must be performed. This consists in carefully dissecting through the coverings of the bowel, and when it is exposed, a long and narrow guarded knife (*Bistouri caché*) is passed by the side of the intestine through the opening into the abdomen, and then making the blade prominent it is withdrawn, and the fibres causing the pressure are divided. This usually allows of the bowel being passed back again into the abdomen, when the operation is completed by bringing the parts together with one or two stitches.

WHEN HERNIA OCCURS IN THE COLT either at the navel or scrotum, it is often desired to effect a cure by returning the bowel and causing the opening to close by adhesive inflammation. If the colt is uncut, the performance of the covered operation on the French plan (see page 443) will generally succeed, great care being of course necessary to return the intestine before the clamps are applied. In umbilical hernia a similar plan has been tried, but the adhesion is too superficial to be of much use; and the only successful method is the passage of one or two skewers through the opposite edges of the opening, and then winding some waxed twine round them, with a moderate degree of force. This should not be sufficient to cause mortification, or the opening will only be increased in size, and the bowel will protrude without any covering of skin; but it should be just sufficient to cause adhesive inflam-

mation ; experience in such matters alone enabling the operator to hit upon the right amount.

IN ALL OPERATIONS FOR HERNIA chloroform is of great assistance, as it prevents the risk of a protrusion of the bowel while the knife is being used, which will otherwise sometimes happen during the struggles of the horse.

THE ADMINISTRATION OF PHYSIC.

MEDICINE may be given to the horse either in the solid form as a ball, or liquid, and then called a drench, or as a dry powder, when in small compass and with little taste, mixed with the corn or mash. Sometimes also a small quantity of a tasteless liquid, such as liquor arsenicalis, may be given with the food.

IN GIVING A BALL, place a halter on the head with a knot, so that the jaws may be widely opened. Then turn the horse round in the stall and back him up to the manger, lay hold of the tongue and draw it out of the mouth, grasp it with the left hand, which must also hold the halter-cord so short that the strain is partly taken off the tongue, and then holding the ball in the right hand with the fingers enclosing it like a cone, and, the arm bare, it should be rapidly carried to the back of the mouth and deposited there, holding the head up till it is seen to pass down the gullet. Cautious grooms use a balling iron, which gags the mouth and protects the arm, but a handy man will have less difficulty in introducing his hand than in inserting the gag, unless the horse is a determined biter, when it may be absolutely necessary. In that case the gag is insinuated with as much ease as a bit in a flat direction, and the handle being suddenly depressed, the mouth gapes and the teeth cannot be brought together. Then holding its handle together with the halter in the left hand, the right easily introduces the ball into the pharynx.

IN GIVING A DRENCH, two persons are necessary, the operator standing at the right shoulder, while the assistant is ready to steady the head and aid him on the left. The operator raises the head with his left hand beneath the jaw, and with his right he forces the lip of the horn into the side of the mouth, and, raising the small end, pours the contents in. If the horse is violent, a twitch must be placed on the nose, and held by the assistant. The horn must not be passed far into the mouth, or any unnecessary violence used, for fear of producing a cough ; in which case, the hand must be instantly lowered. A neglect of this precaution will probably cause some of the liquid to pass into the larynx.

CLYSTERS

ARE MOST VALUABLE AGENTS, if properly administered. The best syringe for the purpose is Read's, by which any quantity may

be thrown up; and in colic, some gallons of warm water are sometimes required to produce the desired effect. For an ordinary opening clyster, a handful or two of common salt may be dissolved in five or six quarts of warm water.

BACK-RAKING

Is EFFECTED by passing the greased hand and arm into the rectum, and withdrawing any hardened fæces which may have accumulated there. When the quantity of these is great, the hand must be passed several times, until it cannot reach any more. Whenever physic is given to an unprepared horse, as is sometimes necessary in severe disease, this precaution should never be neglected. Mr. Gamgee, of Edinburgh, is of opinion that this operation is more safely and easily performed by the aid of instruments, supporting his views by the assertion that the introduction of the hand gives unnecessary pain. On one or two occasions I have certainly seen a shoulder of mutton at the end of a human arm, and this would perhaps cause some little difficulty; but no hand of average size is nearly so large as the mass of dung usually passed; and those who are *not above doing a dirty job when duty requires it*, well know by experience that the hand and arm may be passed to the shoulder without giving any pain whatsoever. Instruments are useful when they cannot be dispensed with, but they are always liable to cause laceration.



CHAPTER X.

THE PRINCIPAL MEDICINES, AND THE DOSES IN WHICH THEY CAN SAFELY BE ADMINISTERED :—

Alteratives—Anæsthetics—Anodynes—Antacids—Anthelmintics—Aperients—Astringents—Blisters—Caustics—Charges—Clysters—Cordials—Demulcents—Diaphoretics—Digestives—Diuretics—Embrocations—Emulsions—Expectorants—Feverifuges—Lotions—Narcotics—Refrigerants—Sedatives—Stimulants—Stomachics—Styptics—Tonics—Vermifuges, or Worm Medicines.

(The Formulæ enclosed in [] are by the American Editor)

ALTERATIVES.

THIS TERM IS NOT VERY SCIENTIFIC, but it is in very general use, and easily explains its own meaning, though the *modus operandi* of the drugs employed to carry it out is not so clear. The object is to replace unhealthy action by a healthy one, without resorting to any of the distinctly-defined remedies, such as tonics, stomachics, &c. As a general rule, this class of remedies produce their effect by acting slowly but steadily on the depuratory organs, as the liver, kidneys, and skin. The following may be found useful :—

1. IN DISORDERED STATES OF THE SKIN—

Emetic Tartar	2 ounces.
Powdered Ginger	3 ounces.
Opium	1 ounce.

Syrup enough to form 16 balls : one to be given every night.

2. SIMPLY COOLING—

Barbadoes Aloes	1 ounce.
Castile Soap	1½ ounce.
Ginger	½ ounce.

Syrup enough to form 6 balls : one to be given every morning. Or,

3. Barbadoes Aloes	1½ drachm.
Emetic Tartar	2 drachms.
Castile Soap	2 drachms. Mix

4. ALTERNATIVE BALL FOR GENERAL USE—

Black Sulphuret of Antimony	2 to 4 drachms.
Sulphur	2 drachms.
Nitre	2 drachms.

Linseed meal and water enough to form a ball

5. FOR GENERALLY DEFECTIVE SECRETIONS—

Flowers of Sulphur	6 ounces.
Emetic Tartar	5 to 8 drachms
Corrosive Sublimate	10 grains.

Linseed meal mixed with hot water, enough to form 6 balls, one of which may be given two or three times a week.

6. IN DEBILITY OF STOMACH—

Calomel	1 scruple.
Aloes	1 drachm.
Cascarilla Bark,) Gentian Root,) Ginger,)	of each in powder . 1 drachm.
Castile Soap	3 drachms.

Syrup enough to make a ball, which may be given twice a week, or every other night.

ANÆSTHETICS.

ANÆSTHETICS (*ἀ*, not, privative; *αἴσθησις*, sensation) produce insensibility to all external impressions, and therefore to pain. They resemble narcotics in their action, and, when taken into the stomach, may be considered purely as such. The most certain and safe way of administering them is by inhalation, and chloroform is the drug now universally employed. The *modus operandi* of the various kinds has never yet been satisfactorily explained; and when the comparison is made, as it often is, to the action of intoxicating fluids, we are no nearer to it than before. With alcoholic fluids, however, the disorder of the mental functions is greater in proportion to the insensibility to pain; and if they are taken in sufficient quantities to produce the latter effect, they are dangerous to life itself. The action of anæsthetics on the horse is very similar to that on man.

ANODYNES,

SOMETIMES CALLED NARCOTICS, when taken into the stomach, pass at once into the blood, and there act in a special manner on the nervous centres. At first they exalt the nervous force; but they soon depress it, the second stage coming on the sooner according to the increase of the dose. They are given either to soothe the general nervous system, or to stop diarrhœa; or sometimes to relieve spasm, as in colic or tetanus. Opium is the chief anodyne used in veterinary medicine, and it may be employed in very large doses:—

7. ANODYNE DRENCH FOR COLIC—

Linseed Oil	1 pint.
Oil of Turpentine	1 to 2 ounces.
Laudanum	1 to 2 ounces.

Mix, and give every hour till relief is afforded.

8. ANODYNE BALL FOR COLIC (only useful in mild cases)—

Powdered Opium		$\frac{1}{2}$ to 2 drachms.
Castile Soap		2 drachms.
Camphor		2 drachms.
Ginger		$1\frac{1}{2}$ drachm.

Make into a ball with Liquorice powder and Treacle, and give every hour while the pain lasts. It should be kept in a bottle or bladder.

9. ANODYNE BALL (ordinary)—

Opium		$\frac{1}{2}$ to 1 drachm.
Castile Soap		2 to 4 drachms.
Ginger		1 to 2 drachms.
Powdered Aniseed		$\frac{1}{2}$ to 1 ounce.
Oil of Caraway Seeds		$\frac{1}{2}$ drachm.

Syrup enough to form a ball, to be dissolved in half a pint of warm ale, and given as a drench.

10. ANODYNE DRENCH IN SUPERPURATION, OR ORDINARY DIARRHŒA—

Gum Arabic		2 ounces.
Boiling Water		1 pint.

Dissolve, and then add—

Oil of Peppermint		25 drops.
Laudanum		$\frac{1}{2}$ to 1 ounce.

Mix, and give night and morning, if necessary.

11. IN CHRONIC DIARRHŒA—

Powdered Chalk and Gum Arabic, each	1 ounce.
Laudanum	 $\frac{1}{2}$ ounce.
Peppermint Water	 10 ounces.

Mix, and give night and morning.

ANTACIDS.

AS THE TERM IMPLIES, these remedies are used to neutralize acids, whether taken into the stomach to an improper extent, or formed therein as products of diseases. They are often classed as alteratives when used for the latter purpose. They include the alkalies and alkaline earths, but are not much used in veterinary medicine.

ANTHELMINTICS.

DRUGS which are used to destroy worms receive this name in medical literature when the author is wedded to the Greek language. The admirers of Latin call them vermifuges, and in English they receive the humble name of worm medicines. Their action is partly by producing a disagreeable or fatal impression on the worm itself, and partly by irritating the mucous lining of the bowels, and thus causing them to expel their contents. Failing the remedy recommended at page 511, the following may be useful:

12. WORM BALL (recommended by Mr. GAMGEE)—

Asafœtida		2 drachms.
Calomel		$1\frac{1}{2}$ drachm.
Powdered Savin		$1\frac{1}{2}$ drachm.
Oil of Male Fern		30 drops

Treacle enough to make a ball, which should be given at night, and followed by a purge next morning.

13. MILD DRENCH FOR WORMS—

Linseed Oil	1 pint.
Spirit of Turpentine	2 drachms.

Mix and give every morning.

ANTISPASMODICS are medicines which are intended to counteract excessive muscular action, called *spasm*, or, in the limbs, *cramp*. This deranged condition depends upon a variety of causes, which are generally of an irritating nature; and its successful treatment will often depend upon the employment of remedies calculated to remove the cause, rather than directly to relieve the effect. It therefore follows that, in many cases, the medicines most successful in removing spasm will be derived from widely separated divisions of the *materia medica*, such as aperients, anodynes, alteratives, stimulants and tonics. It is useless to attempt to give many formulas for their exhibition; but there are one or two medicines which exercise a peculiar control over spasm, and I shall give them without attempting to analyze their mode of operation.

14. IN COLIC—

Spirit of Turpentine	3½ ounces.
Laudanum	1½ ounce.
Barbadoes Aloes	1 ounce.

Powder the Aloes, and dissolve in warm water; then add the other ingredients, and give as a drench.

15. CLYSTER IN COLIC—

Spirit of Turpentine	6 ounces.
Aloes	2 drachms.

Dissolve in three quarts of warm water, and stir the turpentine well into it.

16. ANTISPASMODIC DRENCH—

Gin	4 to 6 ounces
Tincture of Capsicum	2 drachms
Laudanum	3 drachms.
Warm Water	1½ pint.

Mix and give as a drench, when there is no inflammation.

APERIENTS.

(*Physic Balls and Drenches.*)

APERIENTS, or purges, are those medicines which quicken or increase the evacuations from the bowels, varying, however, a good deal in their mode of operation. Some act merely by exciting the muscular coat of the bowels to contract; others cause an immense watery discharge, which, as it were, washes out the bowels; whilst a third set combine the action of the two. The various purges also act upon different parts of the canal, some stimulating the

small intestines, whilst others pass through them without affecting them, and only act upon the large bowels; and others, again, act upon the whole canal. There is a third point of difference in purges, depending upon their influencing the liver in addition, which mercurial purgatives certainly do, as well as rhubarb and some others, and which effect is partly due to their absorption into the circulation, so that they may be made to act, by injecting into the veins, as strongly as by actual swallowing, and their subsequent passage into the bowels. Purgatives are likewise classed, according to the *degree* of their effect, into laxatives acting mildly, and drastic purges, or cathartics, acting very severely.

17. ORDINARY PHYSIC BALLS—

Barbadoes Aloes	.	.	.	.	3 to 8 drachms.
Hard Soap	.	.	.	.	4 drachms.
Ginger	.	.	.	.	1 drachm.

Dissolve in as small a quantity of boiling water as will suffice; then slowly evaporate to the proper consistence, by which means griping is avoided.

18. A WARMER PHYSIC BALL—

Barbadoes Aloes	.	.	.	.	3 to 8 drachms
Carbonate of Soda	.	.	.	.	$\frac{1}{2}$ drachm.
Aromatic Powder	.	.	.	.	1 drachm
Oil of Caraway	.	.	.	.	12 drops.

Dissolve as above, and then add the oil.

19. GENTLY LAXATIVE BALL—

Barbadoes Aloes	.	.	.	.	3 to 5 drachms
Rhubarb Powder	.	.	.	.	1 to 2 drachms
Ginger	.	.	.	.	2 drachms.
Oil of Caraway	.	.	.	.	15 drops.

Mix, and form into a ball, as in No. 1.

20. STOMACHIC LAXATIVE BALLS, FOR WASHY HORSES—

Barbadoes Aloes	.	.	.	.	3 drachms.
Rhubarb	.	.	.	.	2 drachms.
Ginger	.	.	.	.	1 drachm.
Cascarilla Powder	.	.	.	.	1 drachm.
Oil of Caraway	.	.	.	.	15 drops.
Carbonate of Soda	.	.	.	.	$1\frac{1}{2}$ drachm.

Dissolve the Aloes as in No. 1, and then add the other ingredients.

21. PURGING BALLS, WITH CALOMEL—

Barbadoes Aloes	.	.	.	.	3 to 6 drachms
Calomel	.	.	.	.	$\frac{1}{2}$ to 1 drachm.
Rhubarb	.	.	.	.	1 to 2 drachms.
Ginger	.	.	.	.	$\frac{1}{2}$ to 1 drachm.
Castile Soap	.	.	.	.	2 drachms.

Mix as in No. 1.

22. LAXATIVE DRENCH—

Barbadoes Aloes	.	.	.	.	3 to 4 drachms.
Canella Alba	.	.	.	.	1 to 2 drachms.
Salt of Tartar	.	.	.	.	1 drachm.
Mint Water	.	.	.	.	8 ounces. Mix.

23. ANOTHER LAXATIVE DRENCH—

Castor Oil	.	.	.	.	.	3 to 6 ounces.
Barbadoes Aloes	.	.	.	.	.	3 to 5 drachms.
Carbonate of Soda	.	.	.	.	.	2 drachms.
Mint Water	.	.	.	.	.	8 ounces.

Mix, by dissolving the Aloes in the Mint Water by the aid of heat, and then adding the other ingredients.

24. A MILD OPENING DRENCH—

Castor Oil	.	.	.	.	.	4 ounces.
Epsom Salts	.	.	.	.	.	3 to 5 ounces.
Gruel	.	.	.	.	.	2 pints. Mix.

25. A VERY MILD LAXATIVE—

Castor Oil	.	.	.	.	.	4 ounces.
Linseed Oil	.	.	.	.	.	4 ounces.
Warm Water or Gruel	.	.	.	.	.	1 pint. Mix

26. USED IN THE STAGGERS—

Barbadoes Aloes	.	.	.	.	.	4 to 6 drachms.
Common Salt	.	.	.	.	.	6 ounces.
Flour of Mustard	.	.	.	.	.	1 ounce.
Water	.	.	.	.	.	2 pints. Mix.

27. A GENTLY COOLING DRENCH IN SLIGHT ATTACKS OF COLD—

Epsom Salts	.	.	.	.	.	6 to 8 ounces.
Whey	.	.	.	.	.	2 pints. Mix.

28. PURGATIVE CLYSTER—

Common Salt	.	.	.	.	.	4 to 8 ounces.
Warm Water	.	.	.	.	.	8 to 16 pints.

ASTRINGENTS.

(For *Diarrhœa* and *Dysentery*.)

ASTRINGENTS appear to produce contraction on all living animal tissues with which they come in contact, whether in the interior or on the exterior of the body; and whether immediately applied or by absorption into the circulation. But great doubt exists as to the exact mode in which they act; and, as in many other cases, we are obliged to content ourselves with their effects, and to prescribe them empirically. They are divided into astringents administered by the mouth, and those applied locally to external ulcerated or wounded surfaces.

29. FOR BLOODY URINE—

Powdered Catechu	.	.	.	.	.	$\frac{1}{2}$ ounce.
Alum	.	.	.	.	.	$\frac{1}{2}$ ounce.
Cascarilla Bark in powder	.	.	.	.	.	1 to 2 drachms.

Liquorice Powder and Treacle enough to form a ball, to be given twice a day.

30. FOR DIABETES—

Opium	.	.	.	.	.	$\frac{1}{2}$ drachm.
Ginger powdered	.	.	.	.	.	2 drachms.
Oak Bark powdered	.	.	.	.	.	1 ounce.
Alum, as much as the tea will dissolve.	.	.	.	.	.	
Chamomile Tea	.	.	.	.	.	1 pint.

Mix for a drench.

31. EXTERNAL ASTRINGENT POWDERS FOR ULCERATED SURFACES—

Powdered Alum		4 ounces.
Armenian Bole		1 ounce

32.	White Vitriol		4 ounces.
	Oxide of Zinc		1 ounce. Mix.

33 ASTRINGENT LOTION—

Goulard Extract		2 to 3 drachms.
Water		$\frac{1}{2}$ pint.

34.	Sulphate of Copper		1 to 2 drachms
	Water		$\frac{1}{2}$ pint. Mix

35. ASTRINGENT OINTMENT FOR SORE HEELS—

Acetate of Lead		1 drachm.
Lard		1 ounce. Mix.

36. ANOTHER FOR THE SAME—

Nitrate of Silver powdered		$\frac{1}{2}$ drachm.
Goulard Extract		1 drachm
Lard		1 ounce.

Mix, and use a very small portion every night.

BLISTERS, OR VESICANTS.

BLISTERS are applications which inflame the skin, and produce a secretion of serum between the cutis and cuticle, by which the latter is raised in the form of small bladders; but in consequence of the presence of the hair, these are very imperfectly seen in the horse. They consist of two kinds—one, used for the sake of counter-irritation, by which the original disease is lessened, in consequence of the establishment of this irritation at a short distance from it; the other, commonly called “sweating” in veterinary surgery, by which a discharge is obtained from the vessels of the part itself, which are in that way relieved and unloaded. There is also a subsequent process of absorption in consequence of the peculiar stimulus applied.

37. MILD BLISTER OINTMENT (COUNTER-IRRITANT)—

Hog’s Lard		4 ounces.
Venice Turpentine		1 ounce.
Powdered Cantharides		6 drachms.

Mix, and spread.

38. STRONGER BLISTER OINTMENT (COUNTER-IRRITANT)—

Spirit of Turpentine		1 ounce.
Sulphuric Acid, by measure		2 drachms.

Mix carefully in an open place, and add—

Hog’s Lard		4 ounces.
Powdered Cantharides		1 ounce.

Mix, and spread.

39. VERY STRONG BLISTER (COUNTER-IRRITANT)—

Strong Mercurial Ointment	. . .	4 ounces.
Oil of Origanum	. . .	$\frac{1}{2}$ ounce.
Finely-powdered Euphorbium	. . .	3 drachms
Powdered Cantharides	. . .	$\frac{1}{2}$ ounce.

Mix, and spread.

40. RAPIDLY ACTING BLISTER (COUNTER-IRRITANT)—

Best Flour of Mustard	. . .	8 ounces.
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Made into a paste with water; then add—

Oil of Turpentine	. . .	2 ounces.
Strong Liquor of Ammonia	. . .	1 ounce.

This is to be well rubbed into the chest, belly, or back, in case of acute inflammation.

41. SWEATING BLISTER—

Strong Mercurial Ointment	. . .	2 ounces.
Oil of Origanum	. . .	2 drachms.
Corrosive Sublimate	. . .	2 drachms.
Cantharides powdered	. . .	3 drachms.

Mix, and rub in with the hand.

42. STRONG SWEATING BLISTER, FOR SPLINTS, RING-BONES, SPAVINS, &c.—

Binioidide of Mercury	. . .	1 to $1\frac{1}{2}$ drachm.
Lard	. . .	1 ounce.

To be well rubbed into the legs, after cutting the hair short; and followed by the daily use of Arnica, in the shape of a wash, as follows, which is to be painted on with a brush:—

Tincture of Arnica	. . .	1 ounce.
Water	. . .	12 to 15 ounces.

Mix.

43. LIQUID SWEATING BLISTERS—

Cantharides	. . .	1 ounce.
Spirit of Turpentine	. . .	2 ounces.
Methylated Spirit of Wine	. . .	1 pint.

Mix, and digest for a fortnight; then strain.

44. Powdered Cantharides	. . .	1 ounce.
Commercial Pyroligneous Acid	. . .	1 pint

Mix, and digest for a fortnight; then strain.

CAUSTICS, OR CAUTERIES.

(To destroy Proud Flesh in Wounds.)

CAUSTICS are substances which burn away the living tissues of the body, by the decomposition of their elements. They are of two kinds, viz.: First, the actual cautery, consisting in the application of the burning iron, and called firing; and, secondly, the potential cautery, by means of the powers of mineral caustics, such as potassa fusa, lunar caustic, corrosive sublimate, &c.

FIRING is described in the chapter on Operations, at page 438.

The following are the ordinary chemical applications used as potential cauterics:—

45. **FUSED POTASS**, difficult to manage, because it runs about in all directions, and little used in veterinary medicine.
46. **LUNAR CAUSTIC**, or Nitrate of Silver, very valuable to the veterinary surgeon, and constantly used to apply to profuse granulations.
47. **SULPHATE OF COPPER**, almost equally useful, but not so strong as Lunar Caustic. It may be well rubbed into all high granulations, as in broken knees, and similar growths.
48. **CORROSIVE SUBLIMATE** in powder, which acts most energetically upon warty growths, but should be used with great care and discretion. It may safely be applied to small surfaces, but not without a regular practitioner to large ones. It should be washed off after remaining on a few minutes. For the mode of applying it in castration, see page 412.
49. **YELLOW ORPIMENT** is not so strong as Corrosive Sublimate, and may be used with more freedom. It will generally remove warty growths, by picking off their heads and rubbing it in.
50. **MURIATE OF ANTIMONY**, called Butter of Antimony; a strong but rather unmanageable caustic, and used either by itself or mixed with more or less water.
51. **CHLORIDE OF ZINC** is a most powerful caustic. It may be used in old sinuses in solution—7 drachms in a pint of water.

MILDER CAUSTICS :—

52. Verdigris, either in powder or mixed with Lard as an ointment, in the proportion of 1 to 3.
53. Red Precipitate, ditto, ditto.
54. Burnt Alum, used dry.
55. Powdered White Sugar.

MILD LIQUID CAUSTICS :—

56. Solution of Nitrate of Silver, 5 to 15 grains to the ounce of distilled water.
57. Solution of Blue Vitriol, of about double the above strength.
58. Chloride of Zinc, 1 to 3 grains to the ounce of water.

CHARGES

ARE ADHESIVE PLASTERS which are spread while hot on the legs, and at once covered with short tow, so as to form a strong and unyielding support while the horse is at grass.

59. ORDINARY CHARGES—

Burgundy Pitch		4 ounces.
Barbadoes Tar		6 ounces.
Beeswax		2 ounces.
Red Lead		4 ounces.

The three first are to be melted together, and afterwards the Lead is to be added. The mixture is to be kept constantly stirred until sufficiently cold to be applied. If too stiff (which will depend upon the weather), it may be softened by the addition of a little Lard or Oil.

60. ARNICA CHARGE—

Canada Balsam	2 ounce
Powdered Arnica Leaves	$\frac{1}{2}$ ounce.

The Balsam to be melted and worked up with the leaves, adding Spirits of Turpentine if necessary. When thoroughly mixed, to be well rubbed into the whole leg, in a thin layer, and to be covered over with the Charge No. 59, which will set on its outside and act as a bandage, while the Arnica is a restorative to the weakened vessels. This is an excellent application.

CLYSTERS, OR ENEMATA.

CLYSTERS are intended either to relieve obstruction or spasm of the bowels, and are of great service when properly applied. They may be made of warm water or gruel, of which some quarts will be required in colic. They should be thrown up with the proper syringe, provided with valves and a flexible tube.

For the turpentine clyster in colic, see Antispasmodics.

Aperient clysters, see Aperients.

61. ANODYNE CLYSTER IN DIARRHŒA—

Starch, made as for washing	1 quart.
Powdered Opium	2 drachms.

The Opium is to be boiled in water, and added to the starch.

CORDIALS

ARE MEDICINES which act as temporary stimulants to the whole system, and especially to the stomach. They augment the strength and spirits when depressed, as after over-exertion in work.

62. CORDIAL BALLS—

Powdered Caraway Seeds	6 drachms.
Ginger	2 drachms.
Oil of Cloves	20 drops.

Treacle enough to make into a ball.

63. Powdered Aniseed	6 drachms.
Powdered Cardamoms	2 drachms.
Powdered Cassia	1 drachm.
Oil of Caraway	20 drops.

Mix with treacle into a ball.

64. CORDIAL DRENCH—

A quart of good ale warmed, and with plenty of grated ginger.

65. CORDIAL AND EXPECTORANT—

Powdered Aniseed	$\frac{1}{2}$ ounce.
Powdered Squill	1 drachm.
Powdered Myrrh	$1\frac{1}{2}$ drachm.

Balsam of Peru, enough to form a ball.

66. Liquorice Powder	$\frac{1}{2}$ ounce.
Gum Ammoniacum	3 drachms.
Balsam of Tolu	$1\frac{1}{2}$ drachm.
Powdered Squill	1 drachm.

Linseed meal and boiling water, enough to form into a mass.

DEMULCENTS

ARE USED for the purpose of soothing irritations of the bowels, kidneys, or bladder, in the two last cases by their effect upon the secretion of urine.

67. DEMULCENT DRENCH—

Gum Arabic $\frac{1}{2}$ ounce.

Water 1 pint.

Dissolve and give as a drench night and morning, or mixed with a mash.

68. Linseed 4 ounces.

Water 1 quart.

Simmer till a strong and thick decoction is obtained, and give as above

69. MARSHMALLOW DRENCH—

Marshmallows A double hand-

Water 1 quart. [ful.

Simmer, as in No. 68, and use in the same way.

DIAPHORETICS

HAVE A SPECIAL ACTION on the skin, increasing the perspiration sometimes to an enormous extent.

70. ORDINARY DIAPHORETIC DRENCH—

Solution of Acetate of Ammonia . . . 3 to 4 ounces.

Laudanum 1 ounce.

Mix, and give at night. Or,

71. Solution of Acetate of Ammonia . . . 2 ounces.

Spirit of Nitric Æther 2 ounces.

Mix, and give as above.

72. IN HIDE-BOUND—

Emetic Tartar $1\frac{1}{2}$ drachm.

Camphor $\frac{1}{2}$ drachm.

Ginger 2 drachms.

Opium $\frac{1}{2}$ drachm.

Oil of Caraway 15 drops.

Linseed meal and boiling water, to form a ball, which is to be given twice or thrice a week.

73. IN HIDE-BOUND (but not so efficacious)—

Antimonial Powder 2 drachms.

Ginger 1 drachm.

Powdered Caraways 6 drachms.

Oil of Aniseed 20 drops.

Mix as above.

These remedies require moderate exercise in clothing to bring out their effects, after which the horse should be whiped till quite dry.

DIGESTIVES.

DIGESTIVES are applications which promote suppuration, and the healing of wounds or ulcers.

74. DIGESTIVE OINTMENT—

Red Precipitate	2 ounces.
Venice Turpentine	3 ounces.
Beeswax.	1 ounce.
Hog's Lard	4 ounces.

Melt the three last ingredients over a slow fire, and when nearly cold stir in the powder.

DIURETICS.

DIURETICS are medicines which promote the secretion and discharge of urine, the effect being produced in a different manner by different medicines; some acting directly upon the kidneys by sympathy with the stomach, while others are taken up by the blood-vessels, and in their elimination from the blood cause an extra secretion of the urine. In either case their effect is to diminish the watery part of the blood, and thus promote the absorption of fluid effused into any of the cavities, or into the cellular membrane in the various forms of dropsy.

75. STIMULATING DIURETIC BALL—

Powdered Resin	3 drachms.
Sal Prunelle	3 drachms.
Castile Soap	3 drachms.
Oil of Juniper	1 drachm. Mix

76. A MORE COOLING DIURETIC BALL—

Powdered Nitre	$\frac{1}{2}$ to 1 ounce.
Camphor	1 drachm.
Juniper berries	1 drachm.
Soap	3 drachms.

Mix, adding linseed meal enough to form a ball.

77. DIURETIC POWDER FOR A MASH—

Nitre	$\frac{1}{2}$ to $\frac{3}{4}$ ounce.
Resin	$\frac{1}{2}$ to $\frac{3}{4}$ ounce. Mix.

78. ANOTHER MORE ACTIVE POWDER—

Nitre	3 drachms.
Camphor	$1\frac{1}{2}$ drachm. Mix.

EMBROCATIONS.

EMBROCATIONS, OR LINIMENTS, are stimulating or sedative external applications, intended to reduce the pain and inflammation of internal parts when rubbed into the skin with the hand

79. MUSTARD EMBROCATION—

Best Flour of Mustard	6 ounces.
Liquor of Ammonia	$1\frac{1}{2}$ ounce.
Oil of Turpentine	$1\frac{1}{2}$ ounce.

Mix with sufficient water to form a thin paste.

80. STIMULATING EMBROCATION—

Camphor	$\frac{1}{2}$ ounce.	
Oil of Turpentine	$\frac{1}{2}$ ounce.	
Spirit of Wine	$\frac{1}{2}$ ounce.	Mix.

81. SWEATING EMBROCATION FOR WINDGALLS, &c.—

Strong Mercurial Ointment	2 ounces.	
Camphor	$\frac{1}{2}$ ounce.	
Oil of Rosemary	2 drachms.	
Oil of Turpentine	1 ounce.	Mix.

82. ANOTHER, BUT STRONGER—

Strong Mercurial Ointment	2 ounces.	
Oil of Bay	1 ounce.	
Oil of Origanum	$\frac{1}{2}$ ounce.	
Powdered Cantharides	$\frac{1}{2}$ ounce.	Mix.

83. A MOST ACTIVE SWEATING EMBROCATION—

Biniodide of Mercury	$\frac{1}{2}$ to 1 drachm.	
Powdered Arnica Leaves	1 drachm.	
Soap Liniment	2 ounces.	Mix.

EMULSIONS.

WHEN OILY MATTERS have their globules broken down by friction with mucilaginous substances, such as gum arabic or yolk of egg, they are called emulsions, and are specially useful in soothing irritation of the mucous membrane, of the trachea, and bronchi

84. SIMPLE EMULSION—

Linseed Oil	2 ounces.	
Honey	3 ounces.	
Soft Water	1 pint.	
Subcarbonate of Potass	1 drachm.	

Dissolve the honey and potass in the water; then add the linseed oil by degrees in a large mortar, when it should assume a milky appearance. It may be given night and morning.

85. ANOTHER MORE ACTIVE EMULSION—

Simple Emulsion, No. 84	7 ounces.	
Camphor	1 drachm.	
Opium in Powder	$\frac{1}{2}$ drachm.	
Oil of Aniseed	30 drops.	

Rub the three last ingredients together in a mortar with some white sugar; then add the emulsion by degrees.

EXPECTORANTS.

EXPECTORANTS excite or promote a discharge of mucus from the lining membrane of the bronchial tubes, thereby relieving inflammation and allaying cough.

86. EXPECTORANT BALL IN ORDINARY COUGH WITHOUT INFLAMMATION—

Gum Ammoniacum	$\frac{1}{2}$ ounce.	
Powdered Squill	1 drachm.	
Castile Soap	2 drachms.	

Honey enough to form a ball.

87. IN OLD STANDING COUGH (STOMACH)—

Asafetida	3 drachms.
Galbanum	1 drachm.
Carbonate of Ammonia	$\frac{1}{2}$ drachm.
Ginger	$1\frac{1}{2}$ drachm.

Honey enough to form a ball.

88. A STRONG EXPECTORANT BALL—

Emetic Tartar	$\frac{1}{2}$ drachm.
Calomel	15 grains.
Digitalis	$\frac{1}{2}$ drachm.
Powdered Squills	$\frac{1}{2}$ drachm.

Linseed meal and water enough to form a ball, which is not to be repeated without great care.

FEBRIFUGES

(*Fever Balls and Powders*),

GENERALLY CALLED fever medicines, are given to allay the arterial and nervous excitements which accompany febrile action. They do this partly by their agency on the heart and arteries through the nervous system, and partly by increasing the secretions of the skin and kidneys.

89. FEVER BALL—

Nitre	4 drachms.
Camphor	$1\frac{1}{2}$ drachm.
Calomel and Opium, of each	1 scruple.

Linseed meal and water enough to form a ball. Or,

90. Emetic Tartar	$1\frac{1}{2}$ to 2 drachms.
Compound Powder of Tragacanth	2 drachms.

Linseed meal as above. Or,

91. Nitre	3 drachms.
Camphor	2 drachms.

Mix as above.

92. COOLING POWDER FOR MASH—

Nitre	6 drs. to 1 ounce.
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May be given in a bran mash.

93. COOLING DRENCH—

Nitre	1 ounce.
Sweet Spirit of Nitre	2 ounces.
Tincture of Digitalis	2 drachms.
Whey	1 pint.

LOTIONS, OR WASHES

CONSIST in liquids applied to the external parts, either to cool them or to produce a healthy action in the vessels.

94. COOLING SOLUTION FOR EXTERNAL INFLAMMATION—

Goulard Extract	1 ounce.
Vinegar	2 ounces.
Spirits of Wine, or Gin	3 ounces.
Water	1½ pint.

Mix, and apply with a calico bandage.

95. ANOTHER, USEFUL FOR INFLAMED LEGS, OR FOR GALLED SHOULDERS OR BACK—

Sal Ammoniac	1 ounce.
Vinegar	4 ounces.
Spirits of Wine	2 ounces.
Tincture of Arnica	2 drachms.
Water	½ pint. Mix.

96. LOTION FOR FOUL ULCERS—

Sulphate of Copper	1 ounce.
Nitric Acid	½ ounce.
Water	8 to 12 ounces.

Mix.

97. LOTION FOR THE EYES—

Sulphate of Zinc	20 to 25 grains.
Water	6 ounces. Mix.

98. VERY STRONG ONE, AND ONLY TO BE DROPPED IN—

Nitrate of Silver	5 to 8 grains.
Distilled Water	1 ounce.

Mix, and use with a camel-hair brush.

NARCOTICS.

A DISTINCTION is sometimes made between anodynes and narcotics, but in veterinary medicine there is no necessity for separating them. (See Anodynes.)

REFRIGERANTS

LOWER THE ANIMAL HEAT by contact with the skin, the ordinary ones being cold air, cold water, ice, and evaporative lotions. (See Lotions.)

SEDATIVES

DEPRESS THE ACTION of the circulatory and nervous systems, without affecting the mental functions. They are very powerful in their effects; and digitalis, which is the drug commonly used for this purpose, has a special quality known by the name of cumulative—that is to say, if repeated small doses are given at intervals for a certain time, an effect is produced almost equal to that which would follow the exhibition of the whole quantity at once. Besides digitalis, aconite is also sometimes used to lower the action of the heart, and by many it is supposed to be equal in potency to that drug, without the danger which always attends its use.

STIMULANTS.

By THIS TERM is understood those substances which excite the action of the whole nervous and vascular systems. Almost all medicines are stimulants to some part or other, as, for instance, aperients, which stimulate the lining of the bowels, but to the general system are lowering. On the other hand, stimulants, so called *par excellence*, excite and raise the action of the brain and heart.

99. Old Ale 1 quart.
 Carbonate of Ammonia $\frac{1}{2}$ to 2 drachms.
 Tincture of Ginger 4 drachms.

Mix, and give as a drench.

For other stimulants, see Cordials.

STOMACHICS.

STOMACHICS are medicines given to improve the tone of the stomach when impaired by bad management or disease.

100. STOMACH BALL—

- Powdered Gentian $\frac{1}{2}$ ounce.
 Powdered Ginger $1\frac{1}{2}$ drachm.
 Carbonate of Soda 1 drachm.

Treacle to form a ball. Or,

101. Cascarilla, powdered 1 ounce.
 Myrrh $1\frac{1}{2}$ drachm.
 Castile Soap 1 drachm.

Mix, with syrup or treacle, into a ball. Or,

102. Powdered Colombo $\frac{1}{2}$ to 1 ounce.
 Powdered Cassia 1 drachm.
 Powdered Rhubarb 2 drachms.

Mix as in No. 2.

STYPTICS.

STYPTICS are remedies which have a tendency to stop the flow of blood either from internal or external surfaces. They are used either by the mouth, or to the part itself in the shape of lotions, etc.; or the actual cautery, which is always the best in external bleeding, may be employed. Sometimes, however, the part cannot be reached with the heated iron, and is yet within the influence of an injection, as in bleeding from the nostrils, for which the following may be employed:

103. Matico Leaves $\frac{1}{2}$ ounce.
 Boiling Water 1 pint.

Infuse, and when cold strain and inject into the nostrils.

For internal styptics, see Astringents.

TONICS

AUGMENT the vigor of the whole body permanently, while stimulants only act for a short time. They are chiefly useful after low fever.

104. TONIC BALL—

Sulphate of Iron	.	.	.	.	½ ounce.
Extract of Camomile	.	.	.	.	1 ounce.

Mix, and form into a ball. Or,

105.	Arsenic	.	.	.	.	.	16 grains.
	Ginger	.	.	.	.	.	1 drachm.
	Powdered Aniseed	.	.	.	.	.	1 ounce.
	Compound Powder of Tragacanth	.	.	.	.	.	2 drachms.

Syrup enough to form a ball. It is a very powerful tonic.

VERMIFUGES, OR WORM MEDICINES,

ARE DESCRIBED under the head of Anthelmintics, which see.

CHAPTER XI.

ON SOUNDNESS; AND ON THE PURCHASE AND SALE OF HORSES.

THE ELASTIC CONSCIENCE OF A HORSEDEALER has become a byword; but I confess that my experience does not lead me to conclude that the class is more open to charges of unfair dealing than many others whose proceedings have lately been exposed in the Bankruptcy and Nisi Prius law courts. Few intending purchasers of a horse will be content with anything less than what they believe to be absolute perfection in him; and if the seller tells the truth about the animal he has to dispose of, his chance of a sale would be a poor one. The dealer is, therefore, placed in the dilemma of being compelled either to give his horse a character which he does not deserve, or to forego all chance of a sale; and hence it is not surprising that he draws rather extensively upon his imagination. According to my experience, however, amateurs are not exempt from this failing; and if I were compelled to purchase a horse from character alone, I should far prefer relying upon that given by a respectable dealer. The latter class are, no doubt, more skilled in hiding defects and disease, and therefore it requires a more practical knowledge of the horse to detect their artifices where they are sufficiently shortsighted to adopt them. On the whole, however, it may generally be concluded that unless a gentleman has had an extensive experience in purchasing horses, he will do well to place himself in the hands of a dealer, *telling him exactly what he wants*, and not pretending a knowledge which he does not possess.

In all large towns there are men of some character and standing who may be selected for this purpose; and in London, Dublin, Edinburgh, Birmingham, Liverpool, Cheltenham, and Leamington, there are repositories, where horses are sold by auction on stated days. These auction-marts save the vendor from all responsibility, whether pecuniary or moral, unless a warranty is given, either of soundness or freedom from vice, and then the stipulation only lasts for forty-eight hours. If the horse is returned within that time, accompanied by a certificate of unsoundness or vice, the auctioneer must take him back, and return the purchase-money, unless he is prepared to dispute the evidence which is forwarded to him. Under ordinary warranties there is no limitation of the time to which they shall extend, and a horse warranted sound may be returned at any subsequent time if the purchaser can prove that he was unsound at the time of sale. But the lapse of several weeks or months without doing so is generally considered to be a strong argument that the purchaser did not consider the animal to be unsound until he gave notice to the vendor; and this is strong presumptive evidence that the unsoundness did not exist.

THE DEFINITION OF UNSOUNDNESS is, "the existence of disease or alteration of structure which does or will impair the horse's natural usefulness." VICE also may be defined, on a similar principle, as "the prevalence of a habit which interferes with the horse's natural usefulness." But these definitions must be taken with some modifications, for there is not one horse in a hundred which does not possess some disease or vice likely to impair his general usefulness to some slight extent; indeed, the proportion of strictly sound horses may be considered to be much smaller even than this. A bad feeder is so generally from a disordered state of stomach, and such a horse cannot stand work like one which will consume double the quantity of corn, yet he would not be considered unsound; nor would a horse be returnable as vicious if he showed the usual symptoms of being "fresh," though they might impair his usefulness in carrying a timid rider. But subject to such modifications, the above definitions may be accepted as sufficient to make intelligible the terms, Unsoundness and Vice.

THE FOLLOWING DISEASES and accidents are generally considered not to render their possessors unsound:—

BOG SPAVIN, in a slight degree only.

A BROKEN KNEE, unless the joint is injured so as to impair its functions, is not considered to be unsoundness.

CAPPED HOCKS AND ELBOWS do not produce any lameness, nor do they in any way interfere with the action of the joints to which they are adjacent.

CONTRACTION OF THE FOOT is no evidence of disease, and, taken by itself, is not sufficient to prove it to be unsound.

CRIB-BITING was decided, in the cases of *Broennbury v. Haycock* and *Scofield v. Robb*, not to be unsoundness; but Baron Parker ruled in the latter that it came within the meaning of the word "vice." Undoubtedly this is a habit which is generally attended by impaired digestion, and, as such, it comes strictly within the definition given above; but the law is as I have stated it.

CURBY HOCKS, though experience may tell us they are likely to be attended by curbs, are decided not to be unsoundness. In *Brown v. Elkington*, the attention of the vendor was directed to the hocks by the purchaser before the sale, as likely to spring curbs; but in the action on the warranty it was held by Lord Abinger that "a defect in the formation of the horse, which had not occasioned lameness at the time of sale, though it might render the animal more liable to be lame at some future time, was no breach of warranty;" and the Court of Exchequer confirmed this view of the law, by refusing a rule for a new trial.

CUTTING, on the same principle, is no breach of warranty, unless the horse is lame from it at the time of sale.

A **SPLINT** is not, in itself, evidence of unsoundness; but if it is so situated as necessarily to interfere with the suspensory ligament or tendons, or if it has already produced lameness, it is to be accepted as a mark of unsoundness.

THOROUGHPIN, when existing to a moderate extent, is not sufficient to render the horse unsound; but this will always be a question of opinion, and a horse with thoroughpin is, therefore, not to be warranted with safety.

THRUSH, occurring from mismanagement only, and not from any defect in the horse, is clearly not to be considered as unsoundness.

SORENESS of the joints from work, as it soon goes off after a short rest, is not accepted as unsoundness.

WINDGALLS are also only evidences of work, and do not usually cause lameness. When this coexists, it is sufficient to produce unsoundness, without resorting to the windgalls.

THE FOLLOWING LIST comprises the diseases and injuries which have been settled as sufficient to entitle the purchaser to return a horse warranted sound:—

BOG SPAVIN, when it is so severe as clearly to interfere with the action of the joint; and **BLOOD SPAVIN**, as marking an aggravated form of the same disease.

BREAKING DOWN, even though the horse is restored so as to run without lameness.

BROKEN WIND.

CATARACT, in any degree.

CORNS, unless very trifling; but they should be discovered within a few days of the sale, or it may be alleged that they have been produced by subsequent mismanagement.

COUGH, as long as it lasts. A horse with chronic cough is clearly returnable.

CURBS constitute unsoundness; but they must be shown to exist at the time of purchase, for a horse may throw one out immediately after he is transferred to the purchaser.

DISEASES of the organic kind in any of the internal viscera.

FARCY.

FOUNDER, or LAMINITIS, whether it produces lameness or not, if it manifestly has existed, is to be accepted as unsoundness; for when there is evidence of its previous occurrence, the laminæ are injured so much as inevitably to lead to lameness when the horse is put to work.

GREASE, and GLANDERS.

MANGE.

MEGRIMS, when the attack comes on subsequently to the sale, and can be shown to have occurred before it.

A NERVED HORSE is unsound from the existence of the disease for which the operation has been performed, as well as from the division of the nerves.

OPHTHALMIA, if it can be proved to have previously existed, and comes on soon after the purchase, is to be received as unsoundness. So, also, when any of the evidences of its previous presence can be detected, and are proved by a veterinary surgeon, the horse is returnable.

OSSIFICATION of any of the structures adjacent to the joints is unsoundness, and hence ossification of the lateral cartilages will be considered so, without doubt.

PUMICED FOOT, as evidence of laminitis.

QUIDDING.

QUITOR.

RINGBONES, and SIDEBONES, whether large or small, are undoubtedly sufficient to constitute a horse unsound.

ROARING, whistling, &c., as evidence of contraction of the rima glottidis, and therefore interfering with respiration.

RUPTURES OF ALL KINDS.

SPAVIN (bone), although it may not have occasioned lameness, if it is clearly the disease so named.

STRINGHALT has been decided to be unsoundness (*Thompson v. Patterson*).

THICK WIND, as marking some impediment to respiration.

THRUSH, when it is in one of its severe forms, and not caused by mismanagement.

THICKENING OF THE BACK SINEWS, or suspensory ligament, when existing to any extent easily appreciable, is to be received as a proof of unsoundness.

RETURNABLE VICES are comprehended in the following LIST:—

BITING, when carried to any unusual extent.

BOLTING or running away.

CRIB-BITING.

KICKING, when more than usual.

RESTIVENESS, or refusal to proceed in the desired direction.

REARING.

SHYING, when marked.

WEAVING in the stable

WHEN A HORSE IS PURCHASED with the conditions that he is warranted sound, or free from vice, or quiet to ride and drive, the warranty must either be in writing, or given in the presence of a disinterested third person. The form of warranty is as follows, and it is better that it should be on the same paper as the stamped receipt, though this is not absolutely necessary if it is shown that the receipt is properly given.

Date.

Received of A. B. C. fifty pounds for a bay gelding, by Small-hopes, warranted five years old, sound, free from vice, and quiet to ride and drive.

50/.

X. Y. Z.

Any one or more of these points may be omitted, or the horse may simply be warranted "a good hack," in which case he must fairly answer that description. The terms "has been hunted," or "has carried a lady," are not to be trusted, as it is only necessary to prove in defence that the horse has seen hounds, and had a woman on his back.

WHETHER THE HORSE UNDER EXAMINATION is to be warranted or not, the intending purchaser should never omit to look over every point where unsoundness is likely to occur. To do this effectually it should be done regularly, by which there is less chance of passing over any serious defect. The usual mode of proceeding is as follows. Under no circumstances, if it can possibly be avoided, should the horse be looked at immediately after having been out of doors; and if he is of necessity brought to the purchaser, let him be put in the stable and quietly rested for one or two hours at the least, by which time the effects of most of the "coping" tricks will have gone off.

BEFORE THE HORSE PASSES THE STABLE-DOOR, stop him with his head just inside, and in that position carefully examine his eyes. The light is exactly suited to this, and the sensibility of the iris may be well judged of. Any specks or opacities are also here readily seen. Then let him be led to a level surface, and then proceed to look over every part, beginning with that nearest the one already inspected, namely, the mouth. Then "cough" him by tightly grasping the larynx, by which some idea may be formed of

the state of his respiratory organs, after which the usual manœuvre with the stick may be practised if there is no opportunity of examining into his freedom from roaring in the saddle. When these points are satisfactorily disposed of, look to the position of the fore legs, that is, whether they are turned in or out, and if the latter feel the elbows, and see if they are confined or "tied," that is too close to the ribs, also look for marks of cutting and speedy cutting. Pass the hand down the back sinews and suspensory ligaments, examine the knees for any marks, and then carefully feel the coronets and heels for any marks of exostosis or ossification. Lastly, take a good look at the front of the foot, and then lifting it inspect the frog, heels and sole. This will complete the front half of the body, after which the form of the middle and loins should be regarded, and then, lifting the tail, the openness or otherwise of the space round the anus will give some idea of the strength of constitution, while the resistance afforded by the dock will be a sign of the muscular strength of the back. Then look carefully at the hocks, examine the spavin and curb places, and finish the whole by passing the hand down the hind cannon bones to the fetlocks, and feel them in the same order as in the fore legs. Now let the horse rest a minute if his groom will let him, with his head quite at liberty, and you will be able to judge of his ordinary habit of standing, when unexcited. At the conclusion of this careful examination while at rest, the action must be as minutely investigated, by first having the horse walked *with a loose rein*, and then trotted *in the same way slowly*, when if he is sound he will put his feet down regularly and firmly. Grooms, when they want to conceal defects, will not let the head be loose, nor will they trot slowly, but bustle the horse along with their hands as close as possible to the mouth, so as to prevent any nodding of the head as much as they can. A very good judge will be perhaps able to select a pleasant pack or harness horse by seeing him thus run, and afterwards ridden, but a far better test is to ride or drive him yourself, when his freedom from vice, or disease, may be ascertained, as well as his manners, and the ease of his various paces. No trouble should be spared to get this real trial, which is worth ten per cent. on the purchase-money, for many a horse which *looks* to go well does not *feel* so, and it is well worth that sum to be saved the trouble attending upon the possession of a horse which does not suit. When, however, after such a careful examination by a competent judge, and subsequent trial in the saddle or in harness, the horse is found to be really likely to answer all the purposes for which he is wanted, a few pounds should never prevent his being obtained.

GLOSSARY.

BY ROBERT CHAWNER AND J. H. WALSH.

A

- ABNORMAL. Unnatural, irregular, unhealthy.
- ABRASION. Removal of a portion of skin, by violence or ulceration.
- ACCLIMATIZE. To inure to a new climate.
- ACINESIA. Loss of muscular power.
- ACNE. A pustular disease of the skin, involving the sebaceous follicles.
- ACUTE. Active, recent, of brief duration.
- ADENOID. Glandular, or gland-like.
- ADIPOSE. Fatty.
- ADYNAMIC. Prostrate; without power.
- AFFLUX. Flow toward a part.
- ALBUMINURIA. The presence of albumen in the urine.
- ALGID. Cold.
- AMAUROSIS. Partial or total blindness from an affection of the retina, optic nerve, or brain; *i. e.*, *nervous* blindness.
- AMBLYOPIA. Dim, or obscure vision.
- AMENORRHEA. Absence or arrest of menstruation.
- AMORPHOUS. Shapeless; without definite form.
- AMPHORIC. Pitcher-like, or decanter-like. Applied to sounds heard by auscultation or on percussion.
- AMYLOID. Resembling starch.
- ANEMIA. Deficiency of red blood.
- ANESTHESIA. Absence or loss of sensation and perception.
- ANALEPTIC. Invigorating, restorative.
- ANASARCA. General dropsy of the areolar tissue.
- ANEURISM. Morbid dilatation of an artery, with or without rupture of its coats.
- ANFRACTUOUS. Having an irregular, grooved, or broken surface; applied to a cavity in the lung.
- ANGINA. A choking or suffocating disease.
- ANODYNE. Tending to relieve pain.
- ANOREXIA. Loss of appetite.
- ANTHELMINTIC. Destructive of, or tending to cause the removal of, worms.
- ANTI-ARTHRITIC. Curative of gout.
- ANTI-LITHIC. Solvent of stone or gravel.

- ANTI-PHLOGISTIC. Tending to arrest or mitigate inflammation.
 ANTI-PSORIC. Curative of itch.
 ANTI-TOXIC. Antidotal to poison.
 APEX. The uppermost point.
 APHONIA. Loss of voice.
 APHTHE. Small whitish ulcers, originating in vesicles; frequently found in the mouth.
 APLASTIC. Inorganizable.
 APNEA. Arrest of respiration.
 APPLICATA. Things applied to, or brought into contact with, the exterior of the body.
 APYREXIA. Intermision.
 ARACHNITIS. Inflammation of the arachnoid membrane.
 ARTHRITIS. Gout.
 ASCARIDES. Round worms.
 ASCITES. Peritoneal dropsy.
 ASPHYXIA. Suspension of breathing, or of the aeration or circulation of the blood.
 ASTHENIA. Debility.
 ASTHENIC. Without strength; feeble; attended by prostration.
 ATAXIC. Irregular; out of order.
 ATELECTASIS PULMONUM. Imperfect expansion of the lungs.
 ATHEROMA. A pulp-like or pap-like formation or degeneration.
 ATONY. Loss of tone.
 ATROPHY. Absence or defect of nutrition.

B

- BALANCEIVE. Promotive or restorative of balance, proportion, harmony.
 BIOLOGY. The science of life, and of the functions of living beings.
 BLASTEMA. Material out of which tissue is or may be organized.
 BLEB. See Bulla.
 BORBORYGMUS. Intestinal gurgling.
 BRIGHT'S DISEASE. Fatty or other degeneration of the kidney.
 BRONCHOPHONY. Resonance of the voice, in the lung, like that normally heard in the *bronchial* region.
 BRONCHORRHEA. Excessive discharge of mucus from the bronchial tubes.
 BULIMIA, BOULIMIA. Excessive appetite.
 BULLA. A blister; *i. e.*, an elevation of the cuticle, containing serum.

C

- CACHEXIA. A depraved or diseased habit of system.
 CADAVERIC. Belonging to the dead body.
 CALCAREOUS. Containing or resembling chalk or lime.
 CALCULUS. Stone.
 CALVARIA. The cranium.
 CARCINOMA. Cancer.
 CARDIALGIA. Heart-burn.
 CATALEPSY. A nervous affection, characterized by paroxysmal rigidity of the muscles.

- CATARRH. An affection of a mucous membrane, characterized by increased secretion.
- CAVERNOUS. Connected with or indicative of a cavity.
- CEREBRITIS. Inflammation of the brain.
- CHALYBEATE. Containing iron.
- CHLOASMA. Liver-spot; a yellow discoloration of the skin.
- CHOLAGOGUE. Tending to increase the flow of bile.
- CHONDROMA. A cartilaginous tumor.
- CHOREA. St. Vitus' dance.
- CHRONIC. Protracted; continuing, without much change, for a considerable period.
- CINCHONISM. The production of characteristic effects of Peruvian bark, or of its alkaloids, upon the system.
- CIRCUMFUSA. Things surrounding the body; *e. g.*, air, light, moisture, etc.
- CIRRHOSIS. Waxy degeneration of the liver.
- CLAVUS. A corn.
- CLONIC. Successive, interrupted, alternating.
- COLICA PICTONUM. Lead colic.
- COLLIQUATIVE. Copious, exhaustive.
- COLLOID. Jelly-like.
- COMA. Completely unconscious stupor.
- CONGENITAL. Existing at the time of birth.
- CONGESTION. Accumulation of blood.
- CONSONANCE. Repetition or reduplication of sound, by the sonorous vibration of a body upon which it impringes.
- CONTACTIVE. Contagious.
- CONTAGIOUS. Conveyed by touch or actual contact.
- CONTRA-INDICATE. To prohibit.
- CONTRO-STIMULANT. Sedative.
- CORNEITIS. Inflammation of the cornea.
- CORYZA. A cold in the head.
- COSMIC. Belonging to the universal system or order of nature.
- COUP DE SOLEIL. Sun-stroke.
- COXALGIA. Disease of the hip-joint.
- CREPITANT. Crackling; applied technically to the *fine* crackling heard on auscultation in pneumonia.
- CRETIFY. To convert into a chalky substance.
- CUTANEOUS. Pertaining to the skin.
- CYANOSIS. Blueness, from imperfect circulation or aeration of the blood.
- CYNANCHE. Angina.
- CYST. A sac, cell, or bag, formed of membrane, and containing more or less fluid.
- CYSTITIS. Inflammation of the urinary bladder.

D

- DECUBITIS. The manner of lying down.
- DECUSSION. Crossing X-like from side to side.
- DEPLETION. Abstraction of blood or other material from the system.

DERMATOPHYTE. A vegetation upon the skin.

DESIDERATUM. Something desired or required; an important object.

DESQUAMATE. To scale or peel off.

DETRITUS. Refuse; the result of wearing or breaking down.

DIABETES. Excessive urination.

DIABETES MELLITUS. Excessive discharge of urine containing sugar.

DIAGNOSIS. The discrimination of diseases; the determination of the nature of an attack, or of the condition of the organs in a given case.

DIAPHORETIC. Productive of perspiration.

DIASTOLÉ. Dilatation.

DIATHESIS. A constitutional tendency, peculiarity or habit.

DICROIOUS. Double-beating.

DIPHTHERIA. Membranous sore throat.

DIPHTHERITIC. Pseudo-membranous.

DIURETIC. Productive of increased flow of urine.

DRASTIC. Active, powerful

DYNAMIC. Relating to *power* or *force*.

DYNAMIZE. To imbue with force or power.

DYSCRASIA. A morbid state of the blood or of nutrition.

DYSMENORRHEA. Difficult or painful menstruation.

DYSPHAGIA. Difficulty of swallowing.

DYSPNEA. Difficult respiration.

DYSURIA. Difficult urination.

E

ECCHYMOSIS. Effusion of blood under the skin.

ECLAMPSIA. Convulsion.

ECTHYMA. A disease of the skin, characterized by *large pustles*.

ECTROTIC. Abortive; productive of abortion.

ECZEMA. A *vesicular* eruptive disease.

EFFETE. Worn out; dead.

ELEPHANTIASIS ARABUM. An enlargement of the limbs, scrotum, neck, etc.

ELEPHANTIASIS GRECORUM. A severe cutaneous affection, with purple tumors, etc.

ELIMINATE. To remove or drive out from the system.

EMBOLIC. Obstructive; applied to a clot thrown as a plug into an arterial trunk.

EMPHYSEMA. Distention of a cellular tissue with air.

EMPIRICAL. The result of *observation* only; as contrasted with *rational* or *deductive*.

EMPROSTHOTONOS. Arching of the body forward.

EMPYEMA. A collection of pus in the pleural cavity.

EMULSIFY. To suspend or diffuse an insoluble substance in water by means of mucilage.

ENCEPHALOID. Brain-like.

ENCEPHALON. The brain; *i. e.*, the whole contents of the cranium.

ENDEMIC. Local; confined to certain localities.

- ENDERMIC.** Within or under the skin.
ENDOCARDITIS. Inflammation of the lining membrane of the heart.
ENDOSMOSE. The spontaneous interchange of fluids through organic membrane.
ENTERITIS. Inflammation of the bowels.
ENTOOZON. A worm, or other parasite, within an animal body.
ENURESIS. Incontinence of urine.
EPHELIS, Ephelides. Sun-burn.
EPIHEMERAL. Continuing for a day.
EPIGASTRIC. Over the stomach.
EPILEPSY. A disease characterized by recurring convulsions, during which the patient is unconscious.
EPIPHYTE. A vegetable parasite.
EPISTAXIS. Bleeding from the nose.
EPITHELIOMA. An epithelial tumor.
EPITHELIUM. A thin, superficial layer of cells upon a basement membrane.
EPIZOOTIC. Affecting animals over an unlimited region. Not limited to any locality.
EPIZON. A parasitic animal or animalcule.
EQUINIA. Glanders; a malignant disease of the horse, sometimes conveyed to men.
EREMACAUSIS. Decay, or slow combustion.
EROSION. Corrosion; destruction of tissue by chemical agency.
ERUCTATION. Belching of wind.
ERYTHEMA. A florid inflammation of the skin; classed with the *cranthemata*.
ETIOLOGY. The study of the causation of disease.
EXACERBATION. An increase of the symptoms; *c. g.*, of fever; a febrile paroxysm.
EXANTHEM. A rash, or florid eruption.
EXANTHEMATA. A class of diseases in which, with fever there is an eruption characteristic of each.
EXCITO-MOTOR. Reflex; relating to the production of movement in muscles by impressions transmitted through nerves and nerve-centres.
EXCITO-SECRETORY. Reflex excitement of secretory organs by distant impressions, transmitted through the nerves.
EXCRETA. Matters thrown out as waste from the body.
EXFOLIATE. To fall or throw off, like leaves from a tree.
EXOSMOSIS. See Endosmosis.
EXTRAVASATE. To throw blood out from the vessels.
EXUDATION. The throwing out of lymph from the vessels during a morbid process. Also, the lymph itself which is thrown out.

F

- FLOCCULENT.** Resembling locks of wool.
FOMITES. Things supposed to retain and convey contagion or infection; as clothing, merchandise, etc.
FUSCEDO. Yellow staining of the skin in patches or blotches.

G

- GANGRENE. Mortification.
 GASTRALGIA. Pain in the stomach.
 GASTRITIS. Inflammation of the stomach.
 GASTRODYNIA. Stomach-ache.
 GASTRO-HEPATIC. Affecting both the stomach and the liver.
 GESTA. Things *done*; actions; labors.
 GLOSSITIS. Inflammation of the tongue.
 GLUCOHEMIA, Glycohemiam. Excess of sugar in the blood.
 GLUCOSURIA, Glycosuria. The presence of sugar in the urine.
 GOITRE. Bronchocele; enlargement of the thyroid gland.

H

- HABITAT. The locality in which a plant or other living thing grows or abounds.
 HEMATEMESIS. Vomiting of blood.
 HEMATOSIS. Blood formation; blood development.
 HEMATURIA. Voiding of bloody urine.
 HEMICRANIA. Pain in one half of the head.
 HEMIPLEGIA. Paralysis of the arm and leg, etc., of *one side*.
 HEMORRHOIDS. Piles.
 HEPATITIS. Inflammation of the liver.
 HEPATIZATION. Conversion into a liver-like structure.
 HERPES. Tetter; a vesicular eruption.
 HETEROLOGOUS. Different from anything natural to the body.
 HOMOLOGOUS. Parallel to or resembling things natural to the body. In *physiology* this word has a more *extended* meaning.
 HYDATID. A vesicular formation, generally considered to be an *animal parasite*, found in various organs, causing their distention into cysts or tumors.
 HYDREMIA. A watery condition of the blood.
 HYDRAGOGUE. Causing watery discharges.
 HYDRAULICS. The mechanics of liquids; investigating especially the force and phenomena of liquid pressure and movement.
 HYDROCEPHALUS. Dropsy of the head.
 HYDRO-PNEUMOTHORAX. The presence of water and air together in the cavity of the pleura.
 HYDROTHORAX. Water in the chest: thoracic dropsy.
 HYGIENE. The science of health.
 HYGROMETRY. The measurement of the amount of moisture in the air.
 HYPEREMESTHESIA. Excess of blood in a part, with irritability; commonly called *chronic inflammation*.
 HYPEREMIA. Excess of blood in a part.
 HYPERESTHESIA. Over-sensitiveness.
 HYPERINOSIS. Excess of fibrin.
 HYPERTROPHY. Over-growth.
 HYPNOTIC. Promotive of sleep.

HYPOCHONDRIAC. In *anatomy*, the region over the liver, and the corresponding region on the left side. In *medicine*, a person affected with depression of spirits from dyspeptic disease.

HYPOCHONDRIASIS. Dyspepsia with lowness of spirits and imaginary complaints.

HYPOGASTRIC. Below the stomach.

HYPOSTATIC. The result of settling or gravitative deposition.

I

ICHOREMIA. Contamination of the blood; pyæmia.

ICTERUS. Jaundice.

ICTHYOSIS. Fish-skin disease.

IDIOPATHIC. Primary; independent.

IDIOSYNCRASY. Individual peculiarity of system.

ILEUS. Iliac passion. The most violent form of colic.

IMPETIGO. A pustular eruption.

INCUBATION. Development; maturation; the period between the introduction of a morbid cause and the appearance of the resulting disease.

INDICATION. The *pointing* of the signs of disease to the proper mode of treatment.

INDURATION. Hardening.

INFECTION. As frequently used, synonymous with contagion.

INGESTIVE. That which is introduced into the body by the alimentary canal.

INNERVATION. Supply of nervous influence.

INSOMNIA. Sleeplessness.

INTERNUNCIAL. Communicating; transferring mutual impressions or excitations.

INTERSCAPULAR. Between the scapulæ.

INTUSSUSCEPTIO. Convolvulus; the reception of one portion of intestine into another.

IRITIS. Inflammation of the iris.

ISCHURIA. Difficult urination.

K

KAKOTROPHY. Perverted nutrition.

L

LANCINATING. Lancing, piercing, darting.

LARYNGITIS. Inflammation of the larynx.

LATENT. Concealed.

LEPRA. A scaly cutaneous disease.

LESION. Injury; essential change.

LEUCOCYTHEMIA. Excess of colorless or white corpuscles in the blood.

LICHEN. A papular disease of the skin.

- LIENTERY.** Passage of undigested food through the bowels.
LIPOMA. A fatty tumor.
LITHIASIS. The formation of stone or gravel.
LOCHIA. The sero-sanguineous discharge following delivery.
LUMBAGO. Rheumatism of the lumbar region.
LUMBRICUS. A long, round worm.
LUPUS. A malignant affection of the skin, either tuberculous or ulcerative.
LYMPH. The fluid portion of the blood, without the corpuscles; the fluid of the lymphatic vessels; also, the fluid exuded during inflammation.

M

- MACULA.** A spot or stain.
MALARIA. Bad or poisonous air.
MANIA. Derangement, either intellectual or emotional, or both.
MARASMUS. Wasting away.
MATRIX. A formative or receptive structure or cavity.
MELANOSIS. Morbid deposit of, or conversion of tissue into, black pigment.
MENINGITIS. Inflammation of the membranes of the brain.
MENORRHAGIA. Excessive flow of the menses.
METAMORPHOSIS. Transformation.
METASTASIS. The transfer of a disease or symptom from one part to another.
METEORISM. Distention of the alimentary canal with gas.
MIASM. Marsh poison; the local cause of endemic country fevers.
MICROPHYTE. A microscopic vegetation.
MILIARY. A microscopic animalculæ.
MILIARY. Resembling millet seed.
MODUS OPERANDI. The manner of action or operation.
MOLECULE. The minutest particle into which matter can be divided.
MOLLUSCOM. An uncommon tubercular disease of the skin.
MULTIFORM. Having many shapes.
MYALGIA. Pain (or soreness, tenderness) in one or more muscles.
MYELITIS. Inflammation of the spinal cord.
MYELOID. Resembling the spinal marrow.
MYOCARDITIS. Inflammation of the muscular tissue of the heart.
MYOPIA. Near-sightedness.

N

- NEBULOUS.** Cloudy.
NEPHRALGIA. Pain in the kidney.
NEPHRITIS. Inflammation of the kidney.
NERVINE. Affecting the nervous system.
NEURALGIA. Pain, the seat of which is principally in the nerves.
NEUROMA. A morbid enlargement of a nerve.
NEUROSIS. A nervous affection.
NISUS. Effort; attempt; active process.
NORMAL. Natural; regular, healthy.

- NOSOGRAPHY. The description of diseases.
 NOSOLOGY. The classification of diseases.
 NOSOPHYTE. A vegetation connected with, or causative of disease.
 NUCLEOLUS. A central granule or spot within a nucleus.
 NUCLEUS. The central body within a cell; being itself, frequently, hollow.

O

- OCHLESIS. Crowd poison.
 OCTOHEDRAL. Eight-sided.
 ODONTALGIA. Toothache.
 EDEMA. Swelling, from watery effusion in the cellular tissue.
 OPHTHALMIA. Inflammation of the eye.
 OPISTHOTONOS. Arching of the body backwards.
 OPTIMISM. Tendency to the *best possible* result.
 ORGANOGRAPHY. Delineation of the organs in their position.
 OSTEOSARCOMA. Cancerous tumor of bone.
 OTALGIA. Earache.
 OTITIS. Inflammation of the ear.
 OTORRHEA. Discharge from the ear.
 OXALURIA. Presence of oxalic acid (as oxalate of lime) in the urine.
 OZONE. Oxygen in the nascent state, or with its chemical activity otherwise intensified (dynamized).

P

- PALPATION. Examination (of the chest, etc.) by the touch.
 PAPULA. A pimple.
 PARACENTESIS. Tapping.
 PARALYSIS. Loss of power or of sensibility; palsy.
 PARAPLEGIA. Paralysis of the lower half of the body.
 PARENCHYMA. A glandular or other organic structure, formed chiefly of aggregated *cells*.
 PAROTITIS. Inflammation of the parotid gland.
 PATHOGNOMONIC. Positively distinctive or characteristic of a certain disease.
 PATHOLOGY. The study of the seat, nature, and essential characters and laws of disease.
 PELLICULAR. Membranous.
 PEMPHIGUS. A bullar eruption upon the skin.
 PERCEPTA. Things perceived; impressions upon the senses and brain.
 PERICARDITIS. Inflammation of the pericardium.
 PERIPHERAL. Connected with the surface or exterior.
 PERITONITIS. Inflammation of the peritoneum.
 PERTURBATION. Disturbance by an exterior or extrinsic cause.
 PETECHLE. Small purple spots in or under the skin.
 PHLEBITIS. Inflammation of a vein.
 PHLEGMASIA. An inflammatory disease.
 PHLOGOSIS. Inflammation.

- PHOTOPHOBIA. Dread of light.
- PHOTOPSIA. Flashing of light before the eyes.
- PHRENITIS. Inflammation of the brain.
- PHTHISIS. Wasting. Phthisis pulmonalis, pulmonary consumption.
- PICA. Depraved appetite.
- PITYRIASIS. A disease of the skin, accompanied by the exfoliation of minute scales.
- PLASMA. Organizable fluid; liquor sanguinis.
- PLETHORA. Redundance of red blood.
- PLEURITIS. Pleurisy; inflammation of the pleura.
- PLEURODYNIA. Neuralgic pain in the region of the pleura.
- PLEURO-PNEUMONIA. Inflammation involving both the lung and pleura.
- PLEXIMETER. An instrument for *mediate* percussion; a stroke-measure.
- PNEUMONIA. Inflammation of the lung.
- PNEUMOTHORAX. Accumulation of air in the cavity of the pleura.
- POLYDIPSIA. Excessive thirst.
- POLYSARCIA. Obesity.
- POMPHOLYX. A variety of pemphigus.
- PORRIGO. A parasitic disease of the skin.
- POST-ORGANIC. Following organization; effete; having been organized, but no longer capable of vitalization.
- PRECORDIAL. Over or surrounding the heart.
- PREMONITORY. Warning; threatening.
- PRODROMATA. Forerunning signs or symptoms.
- PROGNOSIS. Foreknowledge.
- PROPHYLACTIC. Preventive.
- PRURIGO. An affection of the skin, characterized by great itching, with little or no rash.
- PRURITUS. Itching.
- PSEUDO-MEMBRANE. False membrane; *i. e.*, morbid or misplaced coagulation or organization of lymph.
- PSORA. Itch.
- PSORIASIS. A scaly disease of the skin.
- PTYALISM. Salivation.
- PURPURA. A hemorrhagic affection of the skin.
- PYEMIA. The presence or formation of pus in the blood.
- PYELITIS. Inflammation of the pelvis of the kidney.
- PYREXIA. Fever.

Q

QUININIZE. Too place under the influence of quinine.

R

- RABIES CANINA. Hydrophobia.
- RALE. A rattling sound.
- RAMULE. A small branch.
- RATIONALE. Explanation of a process or occurrence.

- RECUPERATIVE. Restorative; invigorating.
- REFLEX. Reflected; occurring under the influence of a *transmitted* excitation, as contrasted with a *direct* stimulus.
- REGURGITANT. Flowing or escaping backward.
- RENAL. Belonging to or affecting the kidney.
- REMITTENT. Having remissions; *i. e.*, periods of *diminution* of the symptoms (*c. g.*, of fever) without their total *subsidence*.
- RESORPTION. Reabsorption.
- RESUME. Summary; recapitulation.
- RETINITIS. Inflammation of the retina.
- REVULSION. Derivation.
- RHONCHUS. A rattling or roaring, or other abnormal sound, connected with respiration.
- RUBEOLA. Morbilli; measles.
- RUPIA. A bullar and scabbing disease of the skin.

S

- SACCHARINE. Of the nature of sugar.
- SALIVATION. Excessive flow of saliva; usually with soreness of the gums, coppery taste, etc.
- SANITARY. Pertaining to the preservation of health.
- SARCINA. A microscopic vegetation, growing in square or wool-sack-like forms.
- SARCOMA. A fleshy tumor.
- SCABIES. Itch.
- SCHIRRUS. Hard cancer.
- SCIATICA. Neuralgia of the sciatic nerve.
- SCLEROTITIS. Inflammation of the sclerotic coat of the eye.
- SCORBUTUS. Scurvy.
- SEMEIOLOGY. The study of the signs and symptoms of disease.
- SENSORI-MOTOR. Relating to movements which are connected with sensations.
- SENSORIUM. An aggregate term, including those portions of the brain which are the centres of sensation and perception.
- SENTIENT. Endowed with sensation.
- SEPTIC. Putrefactive or decaying.
- SERUM. The fluid portion of blood after coagulation, or after the removal of its fibrin; also, the liquid transuding upon serous membranes; the liquid of certain dropsical effusions, etc.
- SIBILANT. Hissing.
- SOPORIFIC. Promotive of sleep.
- SPANEMIA. Hydræmia; poverty of blood.
- SPERMATIZOEA. Microscopic bodies found in the generative fluid of the male.
- SPHACELUS. Sloughing.
- SPIROMETRY. The measurement of breathing power by the quantity of air exhaled after a forced inspiration.
- SPORADIC. Separate, independent, occasional; not endemic or epidemic or contagious.
- SQUAMA. A scale.

- STASIS.** Stagnation; arrest of movement.
STEATOMATOUS. Fatty; consisting principally of fat.
STERCORACEOUS. Faecal.
STERTORUS. Loud and snoring.
STETHOMETER. A chest measurer.
STETHOSCOPE. A tube used for mediate auscultation.
STHENIC. Possessed of or attended by vigor and activity.
STOMATITIS. Inflammation of the mouth.
STRANGURY. Dysuria, ischuria.
SUBCREPITANT. Crackling, but not typically identical with the crepitant rale; being a coarser sound.
SUBJECTIVE. Originating in the mind, brain, or other part of the individual; as contrasted with *objective*, *i. e.*, of *external* origin.
SUBSULTUS TENDINUM. Jerking of the tendons; *e. g.*, of the wrist in low fever.
SUCCUSSIO. Sudden shaking.
SUDAMINA. Minute transparent vesicles, often seen over the breast or abdomen in low fevers.
SUDORIFIC. Promotive of perspiration.
SUGGILLATION. Collection of blood in spots under the skin of the dead body.
SUPPURATION. The formation of pus.
SYCOSIS. Mentagra.
SYNCOPE. Fainting; suspended animation.
SYNOVIA. The lubricating fluid of the joints.
SYNURGIC. Co-operative; working together.
SYSTOLE. The act of contraction of the heart and arteries; usually applied to the contraction of the ventricles.

T

- TABES.** Wasting; atrophy.
TENIA. Tape-worm.
TEGUMENT. Covering; skin.
TENESMUS. Straining; bearing down.
TENTATIVE. Experimental.
TETANUS. A disease characterized by muscular rigidity.
THERAPEUTIC. Sanative; medicinal; restorative; promotive of the cure of disease.
TINEA. Porrigo; a disease of the skin. *Tinea capitis*, contagious ring-worm.
TONIC. In physiology and pathology, as applied to the muscles, tonic contraction means fixed rigidity. In *materia medica* and therapeutics, a tonic is a strengthening medicine or agency.
TORMINA. Gripping pains.
TORULA. A minute vegetation, found (*Torula cerevisiæ*) in fermenting liquids.
TOXEMIA. Blood-poisoning.
TOXIC. Poisonous.
TRACHEITIS. Inflammation of the trachea.

- TRANSUDATION. Passage of fluid through the walls of vessels.
 TRAUMATIC. Resulting from a wound or injury.
 TRICHOMA. Plica polonica.
 TRIMUS. Lock-jaw.
 TUBERCULIZATION. The deposition of tubercle.
 TUBERCULOSIS. The development of the tubercular diathesis.
 TUMEFACTION. Swelling.
 TURGESENCE. Distension with fluid, usually with blood.
 TUSSIVE. Connected with cough.
 TYMPANITES. Distention of the abdomen with air.
 TYPICAL. Representative; characteristic.
 TYPHOID. Resembling, and yet not identical with, typhus.
 TYPHUS. A form of low continued fever.

U

- UREMIA. The presence in the blood of the constituents of urine from inaction of the kidneys.
 URINA CIBI VEL CHYLI. Urine of food or chyle; *i. e.* that passed after a full meal.
 URINA SANGUINAS. Urine of the blood; *i. e.* that passed in the morning after sleep.
 URINOMETER. An instrument used to estimate the specific gravity of urine; by the distance to which it sinks in the latter, as compared with that to which it will sink in water.

V

- VACCINIA. Cow-pox; vaccination.
 VARICOSE. Dilated; enlarged.
 VARIOLA. Small-pox.
 VARIOLOID. Mild or modified small-pox.
 VASCULAR. Well supplied with blood-vessels.
 VENESECTION. Blood-letting from a vein.
 VERRUCA. A wart.
 VESICAL. Pertaining to the bladder.
 VESICATION. The production of a blister.
 VESICLE. A small blister.
 VESICULAR. Composed of, or resembling, vesicles or small cells.
 VIBICES. Large spots of effused blood under the skin.
 VIBRIO. A minute animalcule, rarely found in animal tissues or cavities.
 VICARIOUS. Substitutive.
 VITILIGO. Partial discoloration of the skin.
 VOLVULUS. Intussusception.





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